DOCUMENT RESUME

ED 112 070 95 CE 004 833

TITLE	Educational Media Technician: A Suggested Two-Year Post High School Curriculum.
INSTITUTION	State Univ. of New York, Alfred. Agricultural and Technical Coll.
SPONS AGENCY	Bureau of Adult, Vocational, and Technical Education (DHEW/OE), Washington, D.C. Div. of Vocational and Technical Education.
PUB DATE	75
CONTRACT	OEC-0-70-4507
GRANT	OEG-0-72-4683
NOTE	138p.
AVAILABLE FROM	Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
EDRS PRICE	MF-$0.76 HC-$6.97 Plus Postage
DESCRIPTORS	Audiovisual Communication; *Curriculum Guides; Design; Educational Technology; Graphic Arts; *Instructional Media; Instructional Technology; *Media Technology; Photography; Post Secondary Education; Reprography; Technical Education; Television

ABSTRACT

The first portion of the guidelines discusses the need to train educational technicians for the field of communications (including education, instructions, industrial organizations or agencies), in order to meet changing educational techniques and the increasing number of resources for learning. A detailed curriculum guide is presented for a two-year post high school program to train educational media technicians in educational technology dealing in visual and audio communication and to give them a knowledge of the uses of media and production equipment. Technical courses are presented first, followed by general education courses and auxiliary technical courses. Five areas of the media are taught: graphics, design, photo/cinematography, television, reprography, and media equipment. A detailed description is presented of each course with the number of hours needed for each divided according to laboratory hours, class hours, and outside study. Texts and references and related media are suggested for each course. Equipment and facilities needed to supply this type of program are described, including estimates of materials and supplies needed for the laboratory and to be purchased by the student. Appended materials include: a bibliography; lists of professional societies and agencies, periodicals, and sources of media; and laboratory plans. (EC)

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EDUCATIONAL MEDIA TECHNICIAN

A SUGGESTED TWO-YEAR POST HIGH SCHOOL CURRICULUM

CE 004833

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Developed pursuant to contract No. OEC-0-70-4507
with the U.S. Office of Education
by the State University of New York
Alfred, New York
and
Printed and disseminated pursuant to grant No. OEG-0-72-4683
with the U.S. Office of Education
by the Curriculum Development Center
Vocational Education
University of Kentucky
Lexington, Kentucky
1975

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

FOREWORD

THE application of technology to education and emerging new methodologies, techniques, facilities, and materials for instruction has caused an educational revolution. This has led to a shift of emphasis from content-centered instruction to individual-centered instruction, reflecting individual needs and individual learning differences. New instructional techniques use many different modes of communication and an ever-increasing variety of media, equipment, and facilities to disseminate more information more effectively and more efficiently. The field of educational media is varied, exciting, and growing rapidly, and, as the field expands, trained personnel are desperately needed. As specialization increases, there is more and more demand for support personnel with technical training; the kind of training which can best be obtained in a 2-year college.

This guide provides a curriculum plan for the media production oriented educational media technician with generalist training. A suggested curriculum plan: course outlines accompanied by tests, references, and related media; laboratory layouts complete with equipment recommendations and costs; faculty and student services and a selected list of professional and technical societies concerned with the technology are provided. The indicated level of instruction is post high school.

Employment opportunities and the need for educational media technician programs should be carefully evaluated through a survey conducted by a carefully selected advisory committee prior to initiating such programs. The inherent attractiveness of the content (photography, television, graphics design) offers a high degree of student appeal, but needs and employment are to a large degree regional.

The breadth of the educational media field suggests additional programs or program combinations. Consideration might be given to combining the educational media technician program with a library technical assistant program or broadcasting technician program or technicians with specialization in a single or combination of media formats. Careful analysis of local or regional needs and tailoring the program to meet these needs is essential.

The guide was developed under contract with the Division of Vocational and Technical Education, U.S. Office of Education, under the direction of William Berndt, Educational Specialist, serving as Project Officer, with technical assistance from Walter Brookings, Technical Educational Specialist, U.S. Office of Education. The basic materials were prepared by David F. Conde, Project Director, State University of New York, Agricultural and Technical College, Alfred, New York, pursuant to a contract with the Office of Education.

Many valuable suggestions and contributions were received from special consultants, media specialists, employees, and from administrators and faculty in community and technical colleges. Although every suggestion could not be incorporated, each was considered carefully in the light of the publication's intended use. In view of this, it should not be inferred that the curriculum is completely endorsed by any one institution, agency, or person. It is a plan for a program; a plan to be modified by administrators and their advisors to meet local, state, and regional needs.

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ACKNOWLEDGEMENTS

THE Agricultural and Technical College at Alfred recognizes the valuable contributions made in the compilation of this document by the individuals listed below:

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THE EDUCATIONAL MEDIA TECHNICIAN PROGRAM

The past decade of technological revolution has brought major change to every aspect of modern society. Of all the changes taking place, perhaps none is more extensive or important than change in education and training. Here, rapid expansion, coupled with critical shortage, exponentially multiplying information, and urgent need for change, has led to unprecedented demand for educational innovation. This has brought about new relationships among some of the changing academic disciplines, (behavioral sciences, instructional technology), educational personnel, and students. These new relationships among people, theories, and things are producing better, more efficient learning, more efficient use of human resources, and major changes in materials, facilities, and techniques of instruction.

New instructional techniques involve a shift of emphasis from content group-centered instruction to individual-centered instruction. In response to individual learning differences, this new method of instruction avails itself of many modes through which information may be communicated.

Educational technique has emerged from dependence primarily upon printed and published materials to a much broader scope in which audio and visual communications are most significant. Information is now available through films, photography, transparencies, audio and videotapes, phonodiscs, print materials and realia, and combinations of media and physical equipment. An equal variety of equipment and facilities are available to produce, disseminate, distribute, store, and retrieve these media.

The resources for learning include not only conventional media but also many newer resources such as student response systems, dial access information retrieval, and recent developments in television and computers. This demands the appropriate use of an ever-increasing variety of instructional resources carefully related to the individual differences, backgrounds, and special needs of the students, and to the educational situation in which instruction occurs.

Learning resource programs are supportive of these instructional efforts. Such programs provide innovative leadership coupled with a multiplicity of resources managed by a qualified staff. The staff is comprised of a variety of professional and support personnel who serve to facilitate the attainment of the instructional objectives.[1]

An integral and increasingly significant part of the learning resource program is the instructional resource center. Such a center may offer services to units varying in size from a large region to a single school. In its makeup, it may include any or all of the following:

Equipment Support Area — an area which houses and distributes instructional equipment. It provides adequate facilities and staff to coordinate selection and evaluation of instructional equipment and organize, distribute, and maintain instructional equipment.

Materials Preparation Center or Media Design Support — an area with adequate facilities and staff to design and produce materials to supplement those commercially available including design and production within five broad categories: (1) Graphic art, (2) Photography/Cinematography, (3) Audio and sound, (4) Television, and (5) Reprography.

Software Support Area — an area which houses and distributes instructional materials. It provides adequate facilities and staff to consult with teachers on the use of a wide range of media in the solution of instructional problems; coordinate selection and evaluation of instructional materials and other teaching resource; organize, distribute, and maintain instructional materials.

The recently completed JIMS project[2] whose primary objective was to look at jobs as they are performed in the instructional media field, with particular emphasis on the support personnel level, emphasizes the need for educational media personnel with generalist training. Programs emphasizing the theory, production, and maintenance of media and equipment, and providing a variety of skills related to instructional media are necessary to prepare graduates for positions in schools, business, and industry.

This guide is directed toward the preparation of educational media technicians with generalist

[1] Association for Educational Communications and Technology, *Guidelines for Two-Year College Learning Resource Programs*, Washington: The Association.

[2] Association for Educational Communications and Technology, *Training Programs for Media Support Personnel*. An Annotated Directory, Washington: The Association.

training to function in instructional resource centers. The degree of sophistication of the communications needs varies widely with the institute, agency, or business and to a large degree dictates the staff requirements. Hence, the degrees of responsibility of the educational media technicians will vary as they are employed in a variety of situations.

Trends toward local production of media, the operation, distribution, maintenance of an increasing variety of both mechanical and electronic devices, and the distribution of a multitude of media cast the educational media technician in an increasingly significant role on the instructional resource staff.

The evolution of audiovisual centers away from their traditional function as agencies for showing films has paralleled the evolution of libraries away from their traditional role as repositories of books. There has been a confluence of accelerated development in both areas which is inextricably interwoven with the technological revolution in education. Accordingly, the development of educational media technician programs may warrant consideration of integrating them with elements of library technical assistant[3] programs. Local and regional needs must also be carefully considered in the development of viable educational media technician programs.

GENERAL CONSIDERATIONS

This guide has been prepared for school administrators or department heads who are considering whether or not to establish 2-year post-high school programs to prepare educational media technicians or are searching for a new technical curriculum to add to their school's technical offerings. It outlines a curriculum which can be "open ended" as far as entrance requirements are concerned and is capable of developing a technician for the "world of work" where the demand far exceeds the supply.

The development of this guide reflects the following sources of information and materials:

1. Information acquired from the experience of having successfully presented for a number of years a technology program to train educational media technicians.
2. Information acquired through visitation of several colleges or institutions considered to be conducting successful training programs for educational media technicians and representing a cross-section of institutions and geographical locations.
3. Reference to the most significant activities, developments, and publications related to the educational media field, namely *Jobs In Instructional Media*,[4] *Visual Communication Education Basic Course*,[5] and *Training Programs for Media Support Personnel*.[6]

The objective of the overall program recommended in this guide is to suggest a sequence of course materials and laboratory experiences designed to produce a competent educational media technician. The technician must be capable of working and communicating directly with education personnel and media specialists, and functioning as a supporting member of an instructional team; of satisfactorily performing the specialized work with immediate productivity; and of growing into positions of increasing responsibility. In addition, the graduate should have a beginning basis for becoming an active, well-informed member of society.

Colleges which establish programs using this guide will find that they can modify the program to fit local conditions of their specific areas or school capabilities and still do a creditable job of preparing persons for employment in the field of educational media. Since it may not be financially possible for a college to offer all phases of instruction in the initial program, it is entirely possible to introduce the technology with instruction in three of the areas, i.e., reprography (duplicating processes), graphics, and photography. School administrators or teachers who wish to make modifications in their program should do so after seeking the advice of a local advisory committee so the resulting program will meet local or regional needs. Prior to initiating a program to train educational media technicians, a careful investigation to justify the advisability and feasibility of implementing the program is essential. The content elements (photography, film-making, television) of the curriculum have inherent student appeal but hiring of graduates is generally

[3] U.S. Department of Health, Education and Welfare, Office of Education. *Library Technical Assistant: A suggested Two-Year Post-High School Curriculum*. Washington: U.S. Government Printing Office, 1971.

[4] Association for Educational Communications and Technology. *Jobs in Instructional Media — Interim Report* (071-02406). Washington: The Association.

[5] *Visual Communication Education, a Basic Course*. Project — Part I Report. Western Washington State College, Bellingham, Wash.

[6] Association for Educational Communications and Technology. *Training Programs for Media Support Personnel: An Annotated Directory* (071-02902). Washington: The Association, 2d edition.

regional. A program of this type should not be undertaken without most of the recommended facilities, equipment, and staff. Even with the best of facilities and equipment, highly effective teaching is necessary to make the program a successful one. The technical content of this program is intended to supply background in both visual and audio communications, together with knowledge of the equipment and facilities for utilization of such media. This necessitates instruction in the areas of graphics design, photography, educational television, film making, reprographics and development of production skills to prepare media in each of these formats. Since the area of instruction is so broad, it is necessary that a close correlation be maintained between both sequenced and concurrent courses. This provides reinforcement of basics and prevents unnecessary instructional duplication.

Basic to the total program is an overview of educational media technology to provide familiarity with the tools, resources, and purposes of the instructional resource center and instructional resource program. This is particularly significant to the students due to the multitude of misconceptions of the role of an educational media technician and the field of educational media technology.

The essential base, or technical foundation, of the program is design and graphics, and photography. These elements provide the basic visual communication principles necessary for the media production areas of film making, educational television, reprographics. Each of the technical specialty areas expand and reinforce these basics while attending primarily to developing the student's production skills and experience with the specific media.

The principles and applications of media equipment are integrated in each of the technical specialty courses. This introduction to equipment coupled with the related technical courses such as mathematics, physics, or electricity-electronics provide the necessary background for a detailed study of media equipment operation and maintenance in the second year.

As photography, film making, television, and media equipment each involves experience with audio techniques, including recording, live narration, sound mixes and synchronizing and audio distribution, this area is not identified as a separate course area or topic.

In each of the courses emphasis is placed upon media and production equipment, economics of media production, and the inherent problems of storage and distribution of the various media. These elements together with the in-depth background in equipment obtained in the Media Equipment Operation and Maintenance course provide much of the technical basis for management of media and resources.

Although the program content is closely related, each of the technical specialty areas predominantly emphasizes a single media. To develop an appreciation for the complete problem of media production and comparative formats, a project laboratory is scheduled in the last semester. The objective of this laboratory is to provide an experience in solving instructional problems through media and to simulate the operation of a production center.

In the final semester, the student is provided the opportunity to gain practical work experience in the institutional resource center or with area institutions, agencies, or businesses. The student will work 6-12 hours per week under the supervision of a media specialist and meet once a week, in seminar, with the instructor to review the experience.

Skilled educational media technicians must have both technical competence and the ability to react positively to a variety of situations encountered in their associations with media specialists, other technicians, and the clientele of the resource center. Thus, the program must provide educational experience that will enable a person to communicate with professionals and to serve as assistants to them.

The degrees of responsibility and the duties of the technician vary, depending upon the objectives, size, and functions of the production services. These functions may be very general or very specialized and departmentalized. The contemporary media design and distribution center would require that the technician have the ability to:

1. Operate, maintain, store, and repair most types of media equipment.
2. Prepare basic artwork or graphic material for television, photographs, still and motion pictures, displays, or printed material.
3. Produce slides, filmstrips, single-concept films, both silent and sound, under direction of a subject matter or media specialist.
4. Prepare camera-ready copy for brochures, poster, booklets, or other instructional materials using design or illustration techniques (including hand, mechanical, or photographic processes) and exhibiting

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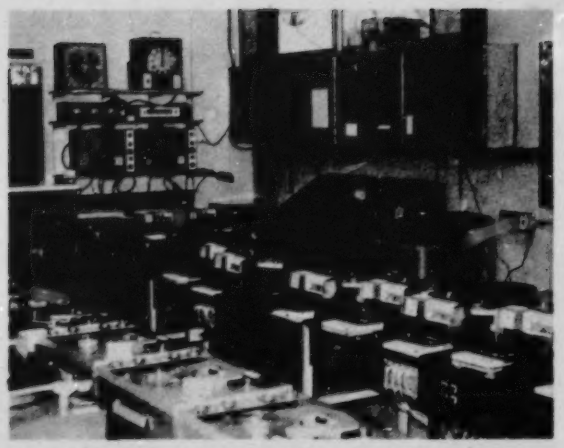

Figure 1—Distribution of audio and video signals together with the distribution of media is necessary to support mediated instruction.

resourcefulness in composition, color, and form.

5. Prepare original or duplicate overhead transparencies.
6. Prepare photographs and slides using both camera and darkroom aspects of photography.
7. Assist in preparing scripts, storyboarding, or production planning of media or materials.
8. Prepare common equipment specifications and requirements for facilities.
9. Assist in advising, planning, and estimating costs of materials and equipment for media production.
10. Assist in producing videotapes, including operation of equipment, technical and production advice, and preparation of production materials.
11. Select, compile, and use technical information and resources to research specific topics.
12. Produce printed material by offset duplication and perform all necessary steps of design, composition, preparation of image carrier and image transfer.
13. Operate audio equipment and use such equipment to produce and distribute audio media.
14. Effectively operate an equipment or material distribution center.
15. Assist in translating concepts of subject matter specialists into media or materials and advise upon most appropriate and economical procedures.
16. Illustrate or prepare media and materials in a manner appropriate to the subject matter and objectives.

Together with these performance abilities, educational media technicians should possess the following general atrributes:

1. The ability to work with people and to enlist their confidence in the technicians' abilities and contributions toward improving instruction.
2. An attitude and concern for quality of media and materials.
3. The ability to recognize and practice "good housekeeping" procedures.
4. The creative ability and imagination to analyze problems and to interpret them into effective media.
5. A thorough understanding of a proficiency in the use of the common materials, processes, apparatus, procedures, equipment, and techniques of the technology.
6. A practical knowledge of the field of specialization with an appreciation for the underlying principles of communications that distinguish the technology.
7. Communications skill that includes the ability to record, analyze, interpret, and transmit facts and ideas with complete objectivity orally, graphically, and in writing.

Graduates of the program can expect to find employment in many areas related to the field of communications, including education, institutions, industrial organizations, or agencies. As the field of educational media continues to develop, the opportunities for the educational media technician should become extensive. Active promotion of the program and a careful, regional survey of employment potnetial is necessary prior to initiation of the program. Educational institutions are, at present, the principal employers of these technicians but interest and acceptance of the technical contributions is rapidly developing opportunities in a multiplicity of institutions, industries, or agencies. The following areas may be identified as potential employers:

1. Educational institutions — including elementary, secondary, post secondary, college or university to prepare media and materials, distribute equipment or media, repair, operate, maintain facilities of the instructional resource center.
2. Business and industrial training departments — to prepare educational

media and to assist conduct of training programs.

3. Business and industrial sales, advertising, or publications departments — to prepare media or materials for in-house or extra-house distribution.
4. Commercial business such as advertising, banking, utilities, public relations companies which emphasize communications.
5. Institutions or agencies such as libraries, museums, service or governmental agencies in preparation, distribution, operation of equipment or processes to develop effective visual communications.
6. Audiovisual industry in the areas of sales, applications and promotion of equipment, materials, and processes.
7. In-plant or in-house printing or duplicating departments in areas of composition, layout, image carrier preparation, equipment operation.
8. Commercial communications industry such as television or news publishing in preparation of media or materials or in operation of equipment for production.

A 2-year program to train educational media technicians must concentrate on primary or fundamental needs if it is to prepare students for responsible technical positions in modern industry. It must be realistic and pragmatic. The program suggested in this bulletin has been designed to provide maximum technical instruction in the time that is scheduled.

To those who are not familiar with the type of educational service (or with the goals and interests of students who elect it), the technical program often appears to be inordinately rigid and restrictive. While modifications may be necessary in certain individual institutions, the basic structure and content of this program should be maintained as closely as possible in order to develop the highest level of skill in the time that is available in a 2-year program.

FACULTY

Responsibility for coordination of the program should be assigned to a person with educational communications, media production and teaching experience at the community college level. In practice, the college instructional resource program or center director often is the coordinator of the educational media technician program. This should be two separate and distinct positions. However, development of a program to train educational media technicians should be closely linked to the learning resources program. In many instances, such ties may be a critical factor in the success or failure of the educational media technician program.

The program coordinator should never be the sole member of the instructional staff. He is responsible for maintaining liaison with employers and other aspects of the field to keep the program current. Other responsibilities include working with advisory committees, employee organizations, employers, and the teaching faculty to define the program goals. He must insure that instruction is effective, must organize course materials, evaluate the program, select appropriate instructional materials, budget for facilities and supplies, assist with advising and placement of students, and coordinate all aspects of the curriculum for consistency with program objectives.

The effectiveness of the program depends largely upon the competence and the enthusiasm of the teaching staff. The specialized nature of the program requires that the teachers of educational media subjects have special competence based on proficiency in technical subject matter and a broad background of related experience. It is important also that all members of the faculty understand the educational philosophy, goals, and unique requirements that characterize this program.

To be more effective, members of the faculty responsible for this program must have interests and capabilities which transcend their areas of specialization. All of the faculty members should be reasonably well informed on the requirements for study in educational media practices so that they may use field examples or subject matter as supporting material in teaching. Without such a background, the teacher cannot give course work the support that is needed in the total program of education for the technicians. Similarly, various scientific principles may be taught in courses in physics and mathematics, and the course instructors may emphasize the principles and illustrate them in design and application of media equipment.

Teachers of specialized technical subjects require advanced technical training. In the past many teachers have been recruited from the graphics, photography, and television professions. Recent experience has shown that graduates of similar technical programs who have continued their technical and professional education often

become excellent teachers in this type of program. Such persons are more likely to understand the objectives and unusual instructional requirements of specialized education. Furthermore, persons with this background often bring to the program an enthusiasm for and appreciation of the values of technical education — characteristics that are essential to the success of any educational program.

Inasmuch as this program is unique in involving five areas of specialization, careful attention must be paid to preventing a single area from dominating the program. Each component must support and reinforce concurrent or previous courses and be integrated toward the program objectives. Such close coordination of courses from multiple specializations demands a faculty or staff with (a) in-depth background and experience in several media, (b) knowledge of the processes, equipment, materials of each media and the educational media field.

Education is more than exposure through lectures and rote learning to the knowledge, ideas, and values current in society. Education can provide means for resolving the range of problems encountered by man in living and in pursuing an occupation. Students must be able to explore fields of knowledge which will enhance their potential as individuals and be relevant to them. The means of exploration include active participation in the classroom and the laboratory, self-directed study, and the use of individualized instructional resources. The student's success in achieving instructional objectives is heavily dependent on access to media and materials. An educational media technician program bears the responsibility to practice what it preaches. The program should emphasize mediated instruction and the development of instructional materials for use in the program. To convince people of the efficacy of the program, the courses should be models in structure, conduct, and use of instructional media.

Trained professional assistance is necessary in the design of instructional systems which contribute to the enrichment of the learning environment for both students and faculty. Technical programs are designed to produce supporting employees who increase the effectiveness of professional teams. The same principle of assistance may be employed to increase the effectiveness of the teaching staff. Staff assistants may be used in stock control, to set out the proper equipment for laboratory classes, to keep equipment operating properly, to fabricate training aids, and to do a limited amount of routine paper grading. When assistants do these important but time-consuming jobs, the teaching staff can devote more time to developing courses and learning resources.

Programs for highly skilled educational media technicians must be a series of well-integrated, hierarchically sequenced courses if the scope and depth of training are to be adequate. New approaches to the organization of faculty should be considered. Team teaching is one possible approach.

Since the field of educational media technology is very broad, it must be recognized that few individuals will have the background information, knowledge, and skills to teach everything in the program. Therefore, it is essential for the instructor to recognize his weaknesses and to employ team teaching or cooperative teaching to present a more effective program. In this sense, team teaching is the organization of the technical staff into a coordinated teaching unit. Teaching assignments are made on the basis of the individual member's special training and talents. Bringing together people from various disciplines makes a better program available for the students and clearly indicates the necessity for better understanding of the interdisciplinary relationships in educational media technology. Team planning allows for concurrent courses to be closely coordinated to best utilize student's time while he is moved smoothly to progressively higher levels. The unique complexity of a five-specialty area program may demand team teaching.

An educational media technology program involves an unusually heavy component of laboratory or workshop exercises. This necessitates a great deal of faculty time devoted to supervision of laboratory activities. The use of laboratory assistants under direction of the professional staff proves to be economical in coping with this situation. Resourceful use of supporting personnel makes it possible to have a small but versatile staff which may be maintained as enrollment varies. By adjusting the size of the supporting staff to the demands of enrollment, a school may at least partly solve the problem of having too few instructors when the enrollment is high and too many instructors if enrollment is reduced. Most of the supporting staff members may be recruited from the student body or from graduates of the program.

To help keep a staff effective, an institution should encourage faculty members to participate actively in professional and technical societies. Through such organizations they can keep up with

new literature and maintain closer liaison with employers of technicians or other leaders in the field. By attending meetings they can hear addresses by outstanding specialists in the field. Technicial school administrators are increasingly encouraging the self-development of staff members by providing released time and financial assistance to those who attend society meetings and technical teacher-training institutes. Periodic or sabbatical leaves should be offered to allow staff members a chance to increase and update their industrial experience, or for further study.

STUDENT SELECTION AND SERVICES

Since the ultimate objective of the program is to produce high-quality graduates, it is essential that the students accepted into the program have certain capabilities. Students chosen for this program should have similar backgrounds and capabilities and should exhibit some evidence of maturity and seriousness of purpose; otherwise, the program might not achieve its objectives. Wide ranges of ability among students can create an inefficient teaching situation and thereby prevent the program from progressing at the necessary rate. It is here that self-instructional materials can be used to great advantage. The amount of material to be presented and the principles to be mastered require students who not only are well prepared in formal course material but who also have the ambition, desire, and will to master a difficult program and to develop their capabilities to the limit.

The program is designed for high school graduates who have particular abilities and interests. In general, students must have demonstrated to their high school counselors that they possess the interest and ability for this training. Because of the inherently attractive elements of the program (photography, television, film making, etc.) many students seek enrollment with little knowledge of the field, opportunities in the field or requirements of the program. Although no specifically identifiable interests or abilities indicate potential for educational media technology, the following should be considered in regard to the program content:

1. Interest and activities in the media or "audiovisual" activities in the secondary institutions.
2. Abilities or background in drawing, drafting, art, and electronics.
3. Mathematics, science, and areas indicating a general technical and mechanical aptitude.

The ability levels of those who do, and those who do not, meet these general requirements will vary greatly. If applicants for admission to the program do not have the necessary scholastic background but clearly possess the necessary intelligence and interest for mastering the curriculum, they should be given the opportunity to enter an organized program for development of prerequisite skills before entering the program.

Effective guidance and counseling are essential. Students should be aided in selecting educational and occupational objectives consistent with their interest and aptitudes. Whenever possible, institutions offering technical programs should consider the use of standardized or special tests to assist in student selection, placement, and guidance. Students should be advised to revise their educational objectives if it becomes apparent that they lack interest in the technical program or lack ability to complete the program satisfactorily.

New students should quickly become familiar with the facilities on campus, especially those which are to be related to their program. If possible, organized field trips to nearby media locations should be arranged early in the program to give new students an opportunity to see educational media technicians on the job. These tours may provide motivation and perhaps point out why certain required subjects are important.

A departmental student organization may be formed to help bring together people with similar interests. The meetings of this organization should provide exercise for the students in arranging their own technical programs. Speakers from schools and media industry or selected films may be used to stimulate interest at meetings. Student organizations may assist with and participate in department activities such as "career days" and "open house" events.

Students should be given information concerning student membership in technical societies and be encouraged to join such societies. Student chapters of professional societies offer an opportunity for the student to receive excellent material on a regular basis at nominal costs, and to associate with professional people in their field at meetings. After graduation, technicians may find affiliation with a society and regular reading of journal articles an important method of keeping their technical knowledge current in the field.

The academic achievement of students should be recognized in some manner. Many institutions grant graduates an associate degree as tangible

recognition of achievement. A departmental club might present an annual award to an outstanding graduate. Private companies might offer to contribute to an annual scholarship award.

Graduates of technical programs should be aided in every way possible in finding suitable employment. Placement officers should be aware of the needs of the educational media industry for technicians and should acquaint prospective employers with the qualifications of graduates. The placement function is an extremely valuable service to the student, the institution, and the employers. In the final analysis, the placement of graduates is an important responsibility and is directly or indirectly the concern of the department head or the instructor who teaches the technical specialty. An excellent placement record is important in getting new students. In addition, the school should conduct periodic followup studies of its graduates to determine their progress and to evaluate their training. Many times such studies can indicate how the program or teaching techniques can be improved.

INSTRUCTIONAL MATERIALS AND REFERENCES

Textbooks, references, and instructional materials for teaching any technology must be reviewed constantly and supplemented in the light of (1) rapid developments of new knowledge and equipment in the field and (2) the results of research in methodology and basic concepts. This is particularly true in the field of educational media. Materials, methods, techniques once considered instructional aids or enrichment are now recognized as integral and essential components of the instructional program. It is imperative that instructors constantly review these instructional materials as they become available and adopt those that are an improvement over those currently in use or suggested in this guide.

Instructional materials are a necessity for conduct of this program to (1) thoroughly acquaint students with instructional techniques and related materials and (2) develop an appreciation for materials and production techniques. Emphasis must be placed upon quality and appropriateness of instructional materials together with proper use of equipment to present the materials. This program is unique in that the student learns not only from what is being taught but equally from the way it is being taught.

LABORATORY EQUIPMENT AND FACILITIES

Laboratories and equipment for teaching educational media technology programs must meet high standards of quality, since the objectives and the strength of the programs lie in students getting valid practical experience, basic in nature and broad in variety. Well-equipped laboratories with sufficient facilities to enable all students to work in the laboratory are required for the courses. The student's training program should include experiences which demonstrate the function and use a wide variety of techniques and equipment.

Variety and quality of equipment and facilities are more important than quantity in production. Production equipment and facilities are a major element of the cost of such a program, but they are indispensable if the training objectives are to be met. A second, but equally important, consideration is that of supplies and materials necessary to operate the production equipment. Expendable supplies such as film, paper, chemicals, transparency film, and masters constitute for this program a major operating expense which may be compounded by incompatible equipment.

Many of the supply items such as photographic chemicals, plates, and specialized film, do not lend themselves to student purchase and are expensive in small quantities.

Much of the equipment suggested is available for purchase or lease. The decision to purchase or lease merits careful consideration in a technology involving rapidly changing techniques, processes, and equipment.

Figure 2—Operation of audio and audio distribution equipment as an important part of the responsibilities of the Educational Media Technician.

In initial development of an educational media technician program consideration should be given to the use of existing production facilities for both instruction and service functions. Although this can be economically practical, a careful analysis of priorities is needed to avoid conflicts which reduce the effectiveness of both operations. Availability of equipment, facilities, and staff is a requisite of instruction of this program.

The number of units purchased, the particular areas of interest, the particular industry emphasis, and the ingenutiy of the instructors in adapting equipment or teaching needs will in part govern the selection and cost of laboratory equipment. Throughout the program, the emphasis should be on the principles which serve as the basis for solving so many different media problems.

To avoid excessive equipment or unnecessary duplication of equipment a systematic, objective approach should be applied to each course area and to the total facility. The constraints of scheduling, concurrent courses, necessary supplied, multiple functions and utilization must be considered.

THE LIBRARY

In any evaluation of a technology program, its strength is indicated by the quality of its library. It is indicated by the qualifications of the librarian; the facilities, the quality, quantity, and relevancy of content; and the staffing and organization of the library. This becomes increasingly significant due to the rapidly changing image of the library as an instructional resource center and due to the potential relationship of educational media technicians to the library. Educational media technicians should become thoroughly acquainted with all functions of the library and be expected to use its resources continuously. Instruction for educational media technician programs should therefore be library oriented so students may learn the importance of the library as a tool in learning and develop an independent approach to reference materials.

SCIENTIFIC AND TECHNICAL SOCIETIES

Scientific and technical societies and educational association are an important source of instructional materials and other benefits for both faculty members and students (see Appendix A). Such societies provide, through their publications and meetings, immediate reports and continuing discussion of new concepts, processes, techniques, and equipment in the education media and related technologies. The presentation and interpretation of new techniques and technical discoveries explain the relationship of the theoretical aspects of the study to the applied science practitioner's requirements. They are an invaluable aid in keeping abreast of new developments in a particular phase of media science.

Less conspicuous, but extremely important, is the support which societies may give (1) in helping to develop evidence of need for a training program, (2) in helping to promote the program, (3) in enlisting members' support for the program , (4) in helping to provide work experience for students, and (5) in helping with the placement of graduates.

Associations and societies may supply resource people to speak to classes. They may also serve as hosts to student groups on field trips to study specific phases of the industry.

Instructors should be encouraged to become active members of these societies so that they may learn quickly of new techniques and developments. Membership will also enable them to meet people in the community who are most actively interested in the field. Some educational institutions pay all, or part, of the costs of membership dues and attendance at local or national meetings in order to encourage staff participation in selected societies.

Early in their studies, students should be required to become acquainted with the literature and services-related societies. They should also be encouraged to join those which offer affiliate memberships.

Some other scientific, technical, industrial groups, and agencies whose publications and services interest teachers and students of educational media are:

American Association of Junior Colleges
American Management Association
American Library Association
Association for Educational Communication and Technology
Association of Technical Artists
Broadcasting Foundation of America
Council on Library Technology
Graphic Arts Technical Foundation
Industrial Audio Visual Association
National Association of Educational Broadcasters
National Association of Industrial Artists
National Audio Visual Association
National Instructional Television Center
Society of Engineering Illustrators
Society of Motion Picture and Television Engineers
Technical Illustrators Management Association
Television Information Office

ADVISORY COMMITTEE AND SERVICES

Prior to initiating any academic programs, a 2-year college should conduct an extensive investigation to justify the advisability and feasibility of implementing the program. The most effective way to examine the feasibility of the program is through the use of an ad hoc advisory committee composed of interested and informed professionals. The committee should be appointed by the chief administrative officer and be comprised of the following members: (1) instructional resource center directors from area institutions, (2) representatives from regional and state associations representing the field, (3) representatives of major local public library and school library, (4) representatives of local or regional communications or advertising industry, (5) representatives from industries, businesses, or agencies concerned with in-plant advertising, training, or printing, and (6) representative of an institution offering a 4-year degree program in this field. Special consideration should be given to people who represent possible employers of educational media technicians or are actively in contact with the educational media field.

The local advisory committee should assist in an extensive survey to determine and define the need for the educational media technician program; the knowledge and skills technicians will require; employment opportunities; available student population; curriculum content; faculty qualifications; laboratory facilities and equipment; resources both within and outside the insitution; and cost and financing of the program. When the studies indicate a program should be initiated, the committee's help in planning and implementing is invaluable.

Frequently the committee substantially helps school administrators to obtain local funds and State and Federal support for the program. When the graduates seek employment, the committee aids in placing them in jobs and in evaluating their performance. Such evaluations often will result in minor modifications, which more closely relate the program to employment requirements.

The advisory committee can use this guide, designed primarily for planning and development on a full time educational media program in post-high school institutions, as a starting point, and modify it to meet local needs. The program can also form the basis for courses to meet the requirements of employed adults who wish to upgrade or update their skills and technical capabilities. In this way the school administration, with the help of the committee and special consultants, can effectively inititate the needed program; quickly develop it to a high level of excellence; and maintain its timeliness.

Very likely this guide will be adapted to suit various situations in schools in differing localities. The assistance of an advisory committee and of special consultants has been found to be of much value in initiating and developing programs. The courses in guides such as this one have often been modified by schools and their advisors to serve employed adults who need to update or upgrade their skills and technical capabilities.

The program is not intended to make individual students proficient in all the duties they might be asked to perform. Proficiency in highly specialized work will come only with practice and experience. It is impossible to forecast the exact requirements of the duties assigned to any technician, and it is almost impossible to predict accurately the course or rate of change of various technologies. Employers generally recognize that the recent baccalaureate graduates may require a year or more to obtain the specific training they need and to orient themselves to their responsibilities and role in an organization. Similarly, employers of newly graduated educational media technicians must generally expect to provide a 3- to 6-month period of orientation on the job.

CURRICULUM OUTLINE

First Semester	Class	Laboratory	Outside study	Total
	Hours Per Week			
Photography	2	8	4	14
Design and Graphics for Media	2	6	4	12
Introduction to Educational Media	2	0	2	4
Mathematics	3	0	6	9
Communication Skills I	3	3	6	12
Total	12	17	22	51

Second Semester				
Filmmaking	2	8	4	14
Educational Media Techniques	2	6	4	12
Physics	3	3	6	12
Communication Skills II	3	3	6	12
Media Photography	0	6	0	6
Total	10	26	20	56

Third Semester	Class	Laboratory	Outside study	Total
	Hours Per Week			
Media Equipment Operation and Maintenance	2	4	4	10
Educational Television Techniques	2	6	4	12
Introduction to Sociology	3	0	6	9
*Media Typing	1	2	6	9
Media Seminar	1	0	2	3
Technical Illustration	1	6	2	9
Total	10	18	24	52

Fourth Semester				
Reprographics	2	6	4	12
Media Productions	1	6	2	9
Management of Media and Resources	3	2	6	11
Psychology and Human Relations	3	0	6	9
Applied Educational Media	1	9	0	10
Total	10	23	18	51

*Typing is recommended if student has not had typing.

BRIEF DESCRIPTION OF COURSES

Introduction to Educational Media

This course will introduce the student to the characterization of the instructional media field as it is utilized in different levels in education. It will include an understanding of the growth of instructional media from its origin to its present state. The study includes a description of the communication, learning, and perception theories.

Photography

An intensive course in photography, including both theory of operation and use of cameras, darkroom equipment, composition, lighting, and processing of black and white materials. An introduction to color photographic theory, including the processing and printing of color materials. Emphasis is on practical photography and visual production including storyboarding and sequencing of pictures for effective visual communications.

Design and Graphics for Media

This course provides the basic esthetic understanding and technical skills needed for design and graphics for media. Development of graphics vocabulary and techniques together with skills in handling the tools of design and graphics. Familiarity with design materials and rendering processes. Extensive laboratory experience develops design and graphics skills together with applied design and graphics art, photography, cinematography, and television.

Mathematics

A basic mathematical program accenting basic arithmetical concepts as they apply in elementary algebra and trigonometry. It includes linear equations and systems, exponents and radicals, trigonometric solution of right-triangle problems, use of slide rule and graphical representations. Emphasis is placed upon selected topics related to the media field.

Communication Skills I

A course in which the student gains experience in writing, speaking, and listening. Each student's strength and weakness is analyzed so that efforts may be made to remedy the deficiencies. Time allotments for the various elements of the course must be based on the class background. The laboratory experience provides practice with techniques of expository communication by means of speaking, writing, and listening and critical analysis of speeches and written prose. Oral presentations and writing practice include applications to the media field.

Filmmaking

The study includes an introduction to the development of motion pictures, language of filmmaking, types of films, types of studio equipment, together with production of films including practices in editing, splicing, animation, lighting, narration, and sound stripping. Film and audio techniques are introduced. The course is supported by a laboratory and complete production experience is provided. Extensive applications of design and graphics are provided through preparation of artwork for both screen and television film.

Media Photography

A laboratory workshop experience to develop the technical aspects of slide and filmstrip production and duplication together with production experience using a variety of facilities and techniques. This course expands the basic principles of photography and applies the principles of design and graphics to the preparation of both artwork and visuals in slide, filmstrip, or photograph formats. An introduction to audio recording and facilities is provided through experience with preparation of sound synchronized slides or filmstrips.

Educational Media Techniques

A course dealing with the development of mounting, laminating, preparation of overhead transparencies, and various forms of display media. Solution of problems using one or many media techniques and providing a realistic atmosphere of a media preparation center.

Physics

This course presents the fundamental principles of heat, sound, light, and electricity as they apply to equipment used in the educational media technology. Through an understanding of these principles as they apply to operating equipment, it is anticipated a broader appreciation of uses and limitations of equipment can be developed.

The supporting laboratories will provide practical experiences with educational media equipment.

Communication Skills II

A course in the practical aspects of written and oral communication. Emphasis will be placed on applied communications including business communications, abstracting, sales presentations, journalism, and scriptwriting. This course will include laboratory time for group discussion and participation and individualized instruction.

Media Equipment Operation and Maintenance

An introduction to the operating principles and utilization of media equipment and facilities. Development of the techniques for correct setup, operation, and basic maintenance of equipment. Repair practices and storage of both equipment and software. Evaluation of specifications, performance, and economics of equipment together with selection and application considerations.

Media Typing

A basic course in beginning typing with extensive applications related to the media field. Development of fundamental typing skills and typewritten communication practice including preparation of spirit, mimeo and direct-image masters for duplicating processes.

Introduction to Sociology

An introduction to basic social science principles and discussion of problems of contemporary society. The course is directed toward increasing the student's awareness of fundamental social processes and social behavior.

Psychology and Human Relations

An introduction to psychology and the

behavioral sciences with emphasis upon developing sound philosophies of human relations. Fundamental concepts of human behavior and development are discussed to create awareness, self-understanding, and the ability to adjust to problems of the social and industrial world.

Educational Television Techniques

A study of television as used in open- and closed-circuit production. The topics covered include the recognition and utilization of television equipment, the efficient design of studio space, programming and production, and experience in scheduling. Also included is the study of the limitations, applications, and economics of television instruction. The main emphasis of the courses will be in handling television equipment and preparing instructional television materials.

Technical Illustration

An applied course where the student uses basic design and drafting skills to solve pictorial problems involved in the illustration of technique brochures, catalogs, and handbooks. Work related to the technical areas of engineering, biology, electronics, and other sciences is emphasized. A number of techniques are used including airbrush, photography, and the use of all types of lettering devices and templates.

Media Seminar

Discussion of career opportunities in the media technology field. Duties, responsibilities, types of positions, types of organizations or institutions, or agencies employing media technicians together with opportunities for continuing education or specialization. Employment application procedures, résumés, portfolio preparation, interviewing, and interview followup.

Reprographics

A course designed to familiarize the student with various duplicating methods, techniques, and equipment with primary emphasis on developing basic skills in offset duplication. Basic techniques of design, layout composition, and illustration are applied to produce printed copy.

Media Productions

This course is a structured, instructed experience dealing with all aspects of production and planning of materials for the solution of instructional problems. Specific group projects will involve planning, organization, estimating together with production of materials in multimedia to complete the projects or case studies. Refinement of basic techniques, materials, and equipment will supplement the project reviews.

Management of Media and Resources

This course surveys the function and responsibilities of the media technician in an industrial and educational media department. It includes management procedures in budgeting, ordering, inventory, production planning, and control systems. Current equipment for media centers will be discussed. Legal implications of media production involving copyrighted resources and commercially prepared instructional materials will be examined. An introduction to library services and organization and the relationship of media production and distribution to the library is examined.

Applied Educational Media

A culminating course in the curriculum; each student will have a choice as to how he wants to complete this requirement. Some may elect to pursue more deeply an area of their choice such as television or photography, or others might prefer an on-the-job work experience either with a campus resource center or an off-campus center. In any event, many of the skills learned to date will be applied here.

In some instances a student may want to repeat this course for additional credit and for the purpose of pursuing additional topics.

CONTENT AND RELATIONSHIPS

The curriculum content and organization necessary to achieve functional competence in so broad a field as educational media technology must meet three major objectives:

1. The training should equip the graduates to take entry jobs in which they will be productive;
2. It should enable them to advance to positions

of increasing responsibility after a reasonable amount of experience; and

3. It should provide a foundation broad enough to support further study within the graduate's field of technology. This curriculum has been designed to meet these three requirements.

A 2-year technology program has certain unique characteristics that influence the content and organization of the curriculum. Some of these are imposed by the occupational functions that graduates must be prepared to perform; some result from the need for special courses that will maximize the effectiveness of teachers who have special competencies; and others arise because of the need to teach both technical principles and related practical applications in the limited time available. A 2-year educational media technician program is unique in that it requires concentration in five related, yet distinct, media areas: graphics design, photography/cinematography, television, reprography, and media equipment. Each of these areas must be carefully interrelated to provide a thorough understanding of basic principles and to broaden the scope of understanding through applications.

This curriculum guide reflects three basic requirements: functional utility, units of instruction in specialized technical subjects, and provision for the teaching of principles of application. It contains the usually recognizable four subject matter divisions: namely, (1) specialized technical courses in the technology (photography, filmmaking, reprography, etc.), (2) auxiliary or supporting technical courses (Introduction to Educational Media, etc.), (3) mathematics courses and science courses, and (4) general education courses. The technical subjects provide applications of scientific principle. For this reason, mathematics and science courses must be coordinated carefully with the technical courses at all stages of the program. General education courses constitute a relatively small part of the total because of the depth in the field of specialization that the program provides. In fact, many students who elect this type of education program will bring to it a good background of general education.

The relationship between laboratory time and class lecture or theoretical study time is of great importance in a technical education curriculum. The theory, skills, techniques, applied principles, materials, information, and processes introduced in the lecture sessions are much more meaningful when laboratory time is provided for the practice of theory and principles introduced. The capability, know-how, and skills that characterize technicians cannot be acquired in classrooms without laboratories. However, organized and related ideas, concepts, and principles can be taught in "theory" classes, if the instructor judiciously uses demonstrations and instructional media, employs selected texts and references, and requires regular and systematic outside study by the student. The student needs to become proficient in obtaining information from printed sources as well as other forms of mediated instruction. Thus, there must be a special relationship between the amount of the scientific and technical specialty taught in the theory classes and that taught in the laboratory.

This curriculum devotes a large part of the time to laboratory hours in the technical specialty during the first two semesters so that the student can acquire introductory and elementary laboratory skills and knowledge of apparatus, tools, processes, materials, devices, and can form good habits of practice in the laboratory as early as possible. Laboratory work can be started before students know much underlying theory. As soon as the underlying theory is developed and they understand it, it can be incorporated into the laboratory work — which then becomes more significant in teaching the subjects in depth.

Since many basic laboratory skills will have been learned in the first year, and since enough basic theory underlying the new material will have been required, the laboratory time required to illustrate principle and to teach new material in second-year courses need not be as long as in the first year. Since more technical specialty courses are studied in the second year than in the first, the total laboratory time is greater than that in the first year. Experience has shown that the relative number of semester hours of science or laboratory work in the technical specialty compared to class theory hours should not be reduced materially in teaching educational media technicians. Such a reduction usually causes the typical student to lose interest and fail or to abandon the course; or it produces a graduate who is deficient in the absolutely essential laboratory capabilities and is unemployable at the technical level.

In technical curriculums it is mandatory that some specialized technical course work be introduced in the first semester. Deferring this introduction even for one term imposes serious limitations on the effectiveness of the whole curriculum. An early introduction of the technical

specialty has several important advantages:

1. It provides motivation. Since the students enrolled in school to study educational media technology, it is important to start their training immediately in that specialty. When the first semester consists entirely of general subjects — English, mathematics, social studies — technical students often lose interest.
2. It makes it possible for the student to achieve greater depth of understanding in specialized subjects in the later stages of the 2-year program.
3. It enables the student to see immediate application of the principles.

Throughout the program, the student is exposed to and develops the skills and production techniques required for meeting the objectives of the organization, distribution of media equipment, and the production, organization, and distribution of media. A knowledge of operational levels of work in a variety of media centers is essential for technicians. Laboratory activities are assigned to develop the necessary skills, an attitude of initiative, resourcefulness and quality of produced media and an attitude of service toward the media centers' clientele.

From the total program, the students should obtain a broad overview of the educational media field and develop production skills in each of the primary media areas. Foundation principles of photography, design, and graphics, with an overview of educational media, provide the graphic communication skills for development of production techniques. The areas of photography and design are considered to be the essential building blocks, as well as representing media formats, and should be located as early as possible. Media photography expands the basic principles of design and graphics and photography with applications to production of slides, filmstrips, and photo essays. Conducted in a laboratory workshop format, this course provides experience with the technical aspects of slide and filmstrip production together with simulated experience in the operation of a design-production center. Reinforcement and expansion of these principles or skills, together with development of production techniques, occurs in the areas of filmmaking, television, educational media techniques, and reprographics. Applications of graphic design principles to film and television graphics, design of artwork for transparencies, and layout, composition, and preparation of materials for information production provide extensive experience with visual communication design. Fundamental principles of photography are refined through utilization of slides in television productions, photo design, and in preparation of image carriers for offset duplication. Cinematography, both screen and television in 8 mm. format, affords a unique relationship between courses. Preparation of television graphics, slides, single-concept films and film clips for television productions affords extensive applications of techniques and skills developed in previous courses. Each of these course areas develops production techniques together with experience in solution of problems using one or several media. Field applications of principles and consideration of the complete problem of production of specific-purpose media and materials is the purpose of Media Productions, Applied Educational Media, and Management of Media and Resources. Such cohesive or coordinating elements provide added reinforcement and the experience necessary for immediate productivity.

Audio principles and applications are integrated throughout the program. Development of sound-synchronized slides or filmstrips, sound films, videotapes and use of audio equipment throughout the educational media equipment laboratory provides considerable practical audio background without being identified as a separate topical area. Each of the technical specialty course areas are interrelated and interdependent in refining and applying the basic skills and techniques. An integral element of both skill and techniques courses is consideration of the economics, production time, and equipment selection-specification. This provides a continuous awareness of costs and facilities together with background information for the Management of Media and Resources. In the same manner, details of equipment, utilization, and application are integrated in all courses and concentrated in the Media Equipment Operation and Maintenance course. Much of the necessary hardware, software, production background for consideration of management, control, distribution, and planning is available prior to the Management of Media and Resources.

The second year of the program brings together the many elements of educational media in the form of Educational Television Techniques, Management of Media and Resources, Media Productions in close alignment with the practices found in the field. This provides a broad and challenging group of experiences for the students duplicating many of the complicated applications

of media principles they will encounter in the field.

The physics course outlined is almost entirely related to media equipment principles and provides much of the technical background for Media Equipment Operation and Maintenance. Should traditional physics or science be substituted, the background topics must be included in t e equipment course. If the program entrance requirements provide adequate mathematics and science background, courses in electricity and electronics could be elected for further capabilities in the equipment maintenance and studio technician areas.

Communication is an important element in technical work. The educational program includes specific instruction in visual, written, and oral audio communication. Throughout the Communication I and II courses, maximum effort is made to relate the mechanics to the media field and to the technical specialty with emphasis upon reports, scriptwriting, narratives, and the visual aspects of communications.

The liberal arts or general studies component of the program could be of supporting nature depending upon the course availability of the institution. Ideally, because of the necessity for overall effectiveness of a 2-year program, related course selections should enhance the curriculum. It is suggested that the following be considered.

a. Psychology
b. Human Relations
c. Educational Psychology and Learning Theory
d. American Public Education: Its Structure and Economics

Additional electives which would serve to broaden the technician's background might be selected from the business offerings of the institution. Courses such as advertising principles, salesmanship, basic accounting, merit consideration.

The overall conduct of this program should emphasize the following:

a. Maximum use of mediated instruction with careful attention to quality, appropriateness, and effectiveness of media.
b. Emphasis upon quality and professional production of media or materials.
c. Continuous exposure to media and materials related to many fields to build exposure to techniques and applications.
d. Continuous emphasis upon evaluation of topical areas for appropriateness of media.
e. Careful attention to the interrelationships of courses and topical materials is necessary. Concurrent and succeeding courses should provide mutual support and reinforcement through application of principles in varying circumstances and through repetition.

The course outlines in this guide are short and descriptive. The individual instructor will have to prepare complete courses of study and arrange the curriculum material in logical order of teaching before starting instruction. He must also select or develop instructional materials needed for large group and individual instruction. Suggested laboratory layouts and equipment found under "Facilities" may be helpful to instructors preparing to teach the courses.

The material is not intended to be applied to a given situation exactly as outlined; it is presented to illustrate the form and content of a complete educational media technology program. In keeping with the form of previously published guides, it is planned as a full-time post-high school preparatory program. It is expected, however, that these materials will be of use also in planning extension courses and preparatory technical programs in secondary schools.

The overall curriculum is presented with the principal topical areas segregated to facilitate developing basic skills and techniques of each media or format. Depending upon faculty and facility resources and enrollment, a unified concepts approach could be readily applied, intergrating topical areas while maintaining the essential content.

The basic program further lends itself to development of viable major or specialization areas through the additional courses in the areas of photography, television, graphics design, or reprographics. Modification of the basic program to accommodate the objectives or resources of the institution or area is easily accomplished. In this regard, it is felt the program is flexible as well as expandable.

COOPERATIVE EDUCATION PLAN

This technology is adaptable to a cooperative arrangement; a plan which offers important advantages to students, to the school, and to employers of technicians. A cooperative education program is a plan for a student to learn through coordinated study and employment experience. Students alternate periods of attendance at the institution where they are obtaining their technical education with periods of employment in business

or industry. The employment constitutes an essential element in their education. The students' employment should be related as closely as possible to some phase of the field of study in which they are engaged.

When students test their knowledge of theory in a work situation, study becomes more meaningful. Co-op students learn not only the essentials of their technology but also the importance of reliability, cooperation, and judgment as employed workers in their chosen field.

The co-op students' career choices are stimulated and shaped by their work experiences. If they find satisfaction in their work, they return to the classroom stimulated to learn as much as possible about their future career. If they find through their work experience that they are not fitted to a specific area of work, they may decide to change their major field of study when they return to the college. This decision may prevent them from wasting time and money on a misguided choice of study.

A class of students in cooperative technical programs usually spend the first semester or the first two quarters in school; then it is divided so that half the students have a semester or quarter of employment experience while the other half continues to study. During the next semester or quarter, the half who have worked return to their formal studies at school while the other half are employed. They usually alternate again so that all students have two semesters or at least two quarters of work experience in their program. The student's technical program is lengthened beyond the curriculum outlined in this document by an amount of time equal to the total length of the employment experience.

Specific employment is obtained, as circumstances permit, by the educational institution with the cooperation of the student. The institution regards the work experience program as an integral part of the technician program as a whole. It is not regarded primarily as an opportunity for earning, although each student while working is paid at the prevailing wage scale for the job held. Work reports by both the student and the employer are submitted to the school work program coordinator.

The cooperative work experience program is an opportunity for students to gain directly related experience which makes them more valuable as employees. As a result of their work experience in particular establishments, many students have been offered permanent positions upon completion of their schooling. Cooperating establishments agree, however, not to make offers of employment which become effective before the technician completes the program.

Cooperative programs provide opportunities for the educational institution to maintain close contact with employers in their various programs. This contact becomes a two-way channel of communication which helps the educational institution to keep its knowledge of specific employer needs in each technical field up to date, and at the same time keeps employers acquainted with and involved in the program of the institution.

Cooperative education is not always available to students in this program. Frequently, institutions at all levels do not have funds for part-time employees or experience difficulty in approval of this as a budget item. The success of a cooperative program will depend largely upon the area and merits careful consideration during program development.

SUGGESTED CONTINUING STUDY

A 2-year curriculum must concentrate on the primary needs of science, mathematics, and the related knowledge and skills in the technical specialty necessary to prepare the student for employment upon graduation.

Obviously, a 2-year program cannot cover in depth all of the subjects pertinent to the technology; certain important, related subjects may only be touched upon. In addition, the graduate may obtain work in an area of the industry so new that adequate coverage in the training program has not yet been developed.

The breadth of the educational media field and necessity for technicians to function productively in several visual and audio formats does not leave room for specialization. One of the areas for continuing study would be the development of a specialty such as television, graphic design, or reprographics with the goal of becoming a media specialist. A segregated topical area approach in the initial 2 years allows this type of specialty identification and interest.

A second area of opportunity for continuing study is in educational communications. A practical production background provides a valuable contrast to the background of communication specialist or instructional technologist.

COURSE OUTLINES

The courses outlined comprise a suggested guide to the objectives and content of a 2-year curriculum to train educational media technicians. The materials suggested provide a practical and attainable coverage of the field and have been reviewed by experienced instructors in successful educational programs for educational media technicians and by experts representing employers of such technicians.

Course outlines include a description of course content with suggested methods and procedures for conducting class and laboratory activities. Performance level objectives are included for each course. They indicate, in broad terms, what the student should be able to do to demonstrate attainment of the objectives following the teaching-learning experiences provided in each course. Course content, suggested conduct, and instructional materials are selected to meet the objectives.

Outlines are designed to cover a 16-week instructional period, but a 17-week semester is assumed to allow for evaluation of student performance. By using the performance objectives and planning the instruction around them, forms of individualized instruction may be developed. Thus, the time needed could vary widely with the ability of the student. Continuous evaluation throughout the course, including written, oral, and performance procedures, is desirable for both the student and the instructor. It enables the students to assess their progress and direct their efforts accordingly. The instructor can assess the effectiveness of instruction and devise methods and materials as necessary.

At the end of each course there is a list of text and reference materials. Each item should be analyzed for its content and pertinency, and new and more suitable ones should be used if they are available. The information needed to cover a particular course in technician curriculums, particularly the technical specialty courses, is almost never available in one textbook; hence the multiple listing of references. They should usually be considerably augmented by current materials from manufacturers, trade journals, technical societies, and suppliers of equipment and materials in the special field of applied science being studied.

Commercially produced, related instructional materials are suggested for most of the courses. These materials should be previewed before use and selected on the basis of specific contributions to attainment of the objectives, usually commercially produced materials must be supplemented by locally produced materials. It is imperative that each course be structured to include active participation in the classroom and the laboratory, self-directed study and use of individualized instructional resources, as well as being a model of effective mediated instruction.

Successful programs can be conducted as semester, quarter, or trimester systems. The two-semester a year system illustrated in this document can be changed into three quarters or terms if advisable to meet community needs. Course content can be distributed over six quarters. For example, the photography course could be taught over two quarters, logically separated with basic photographic principles the first quarter and media preparation (slides, filmstrips, artwork rendering, etc.) the second quarter. In like manner, Design and Graphics for Media and Technical Illustration would comprise a continuous sequence of three design and graphics courses for a quarter system. Educational Television Techniques would be distributed over two quarters, presenting basics of equipment and production the first quarter and a production-oriented course the second quarter. The content of other courses could readily be redistributed to conform to a quarter system and should offer no insurmountable obstacles since the total time in six quarters is the same as in four semesters.

The materials will very likely be modified to fill local needs and to take advantage of special interests and capabilities of the teaching staff; but the implied level, quality, and completeness of the program should not be compromised.

The laboratory sessions suggested in the outline and in the course descriptions are not intended to be a single session but rather to be scheduled in reasonable and effective increments. For example, a 9-hour laboratory per week for a course might be scheduled as three 3-hour sessions, or any other divisions of laboratory time that seem appropriate. Many of the courses are predominantly laboratory oriented to develop the necessary production skills and experience. Conduct of the laboratory should include self-instructional procedures, performance evaluations and emphasize production economics, facilities, scheduling, and, above all, quality.

INTRODUCTION TO EDUCATIONAL MEDIA

Hours Per Week

Class, 2; Laboratory, 0

Description

This course is a general introduction to the field of instructional media, the role of the media support technician and the educational media curriculum. Here the students are given an understanding of and an appreciation for the entire field of instructional media. They are presented problems that occur in media centers that relate to the media technician. The course also strives to give the student an appreciation for the historical significance of media beginning with the earliest example of man communicating visually. The student studies various models of communication as they relate to the development of media software and briefly touches upon learning theory.

The course meets in lecture exclusively. It is anticipated that considerable time will be given for student participation and reaction. Such classroom discussion will give the students a better chance to understand how they will be trained and what they should be able to perform upon completion of their 2-year education.

In addition to the prepared lecture material, it is anticipated that two or three guest speakers would be invited from various levels of instruction as listed below. Their purpose would be to give firsthand information of an actual ongoing educational media operation.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Philosophy and Aims of Educational Media and Educational Media Production Centers	12	0
II. The Role of the Media Support Technician	8	0
III. History of Instructional Media	4	0
IV. Theories of Communication, Learning, and Perception	8	0
Total	32	0

I. Philosophy and Aims of Educational Media and Educational Media Production Centers

A. Performance objectives

Upon completion the student should be able to:

1. Identify nonprojected media, projected media, audio media, video media, given the actual piece of equipment
2. Identify the major characteristics of large group instruction, small group instruction, and independent student study, and relate this information to the proper selection of a learning space
3. List various forms of printed media and how it effects the media support technician
4. Construct a simple systems approach to course and curriculum development
5. Identify media equipment that could be combined in order to implement the multimedia approach
6. List the characteristics of programmed instruction
7. Identify those media known as realia
8. List the characteristics of media as it is used in various instructional levels

B. Units of instruction

1. Characteristics of nonprojected media
2. Characteristics of projected media
3. Characteristics of audio
4. Characteristics of television
5. Various spaces for learning and their characteristics
6. Characteristics of print media
7. The elements of the systems approach as used in education
8. Characteristics of the multimedia approach
9. Characteristics of programmed instruction
10. Characteristics of realia
11. Media as used in higher education, elementary and secondary education, military training, and industrial training

II. The Role of the Media Support Technician

A. Performance objectives

Upon Completion the student should be able to:

1. List the functions of a hardware oriented media technician
2. List the functions of a software oriented media technician

B. Units of Instruction
1. Equipment inventory and distribution
2. Equipment upkeep and maintenance
3. The preparation of graphics for software development
4. The setting up and operating of equipment for media presentations
5. Software inventory and distribution

III. History of Educational Media
A. Performance objectives
Upon completion the student should be able to:
1. Identify by name early educational writers who implied media for instruction
2. Trace the steps in the development of educational media into a technology
B. Units of instruction
1. The writings of the Elder Sophists, the teachings of the Socratic method, Abelard, Comenius, Pestalozzi, Froebel, Herbart
2. Early forms of media such as the school museums, the instructional film and the audiovisual technique
3. Professional audiovisual organizations of the past and present as well as their magazines and journals
4. Recent emphasis on learning rather than on the tools of learning

IV. Theories of Communication, Learning, and Perception
A. Performance objectives
Upon completion the student should be able to:
1. Trace the components of the Berlow SMCR model of communication
2. Identify the difference among the following as studied by Pavlov
a. Conditioning
b. Extinction
c. Generalization
d. Discrimination
3. Identify the differences among the following as studied by Thorndike
a. Exercise
b. Readiness
c. Effects
d. Intelligence
4. Identify the differences among the following as studied by Skinner
a. Reinforcement
b. Punishment
c. Shaping
5. Identify the differences among the following as studied by Gagné
a. Signal learning
b. Stimulus-response learning
c. Chaining
d. Verbal association
e. Multiple discrimination
f. Concept learning
g. Principle learning
h. Problem solving
6. State a perception theory that shows the interaction between the perceiver and the object perceived
B. Units of instruction
1. The Berlo SMCR communication model
2. Pavlov study of animal conditionins
3. The learning cycle as stated by Thorndike
4. The theory of linear programming stated by B.F. Skinner
5. The conditions of learning by Gagne
6. Perception considerations such as proximity, similarity, common movement, continuity, closure, contrast, figure ground, depth cues, overlap, perspective, movement

Texts and References
Related Media

Ball, and Bynes (eds.). *Research, Principles, and Practices in Visual Communication.*

Brown, Lewis, and Harcleroad. *Audio-Visual Instruction: Media and Methods.*

Class of '01 — The College of Tomorrow. 25 min., 16 mm.
Summary: A film made by CBS for their 21st Century series showing technological innovations in college instruction and how these innovations are being accepted.

Eye of the Beholder. 25 min., 16 mm., sd., b & w.
Summary: Develops the theme that no two people see the same thing or situation in the same way.

Perception and Communication. single concept film.
Summary: One of a series of films that meets the needs of those teaching communications theory and educational media.

The Teacher and Technology. a single concept film.
Summary: One of a series of films that meets the needs of those teaching communications theory and educational media.

PHOTOGRAPHY

Hours Per Week
Class, 2; Laboratory, 8

Description

An intensive course in basic media photography including camera and darkroom equipment, lighting and composition, processing and printing of black and white photographic materials. Introduction to copy work, black and white transparencies, print to transparency conversion, single concept photography and planning and storyboarding for slide and filmstrip preparation.

Relation to and application of design and graphics is accomplished through preparation of mechanicals for the photographic laboratories. Throughout the course, emphasis is placed upon developing skills and techniques as foundations for media photography, television, reprography and filmmaking, introduction to color transparency processing.

Conduct of the course is almost entirely laboratory oriented with selected projects or exercises to develop techniques and skills of both camera and darkroom photography. Because of this, lecture and laboratory exercises do not necessarily coincide. Each laboratory exercise or project would necessitate pre-laboratory lecture, lecture demonstration or individualized instruction. Exercises emphasize media-related photography.

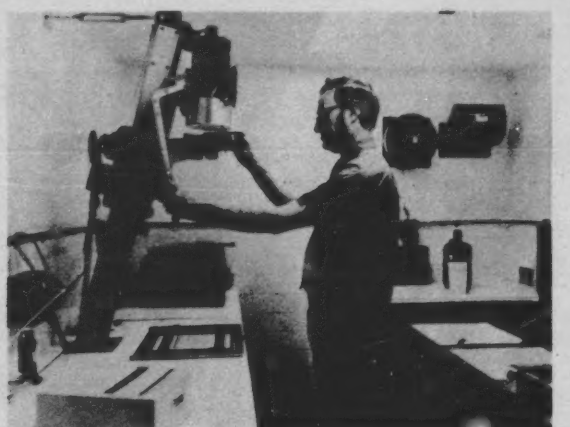

Figure 3—Educational Media Technicians work with photographic darkroom facilities to prepare both black and white and color prints.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Introduction to Photography ...	2	0
II. Camera Types and Utilization ..	4	4
III. Photographic Processes	12	88
IV. Lighting and Lighting Techniques	4	20
V. Small Object Photography	4	8
VI. Color Photography	4	0
VII. Reversal Color Film Processing .	2	*8
Total	32	128

I. Introduction to Photography
- A. Performance objectives
  Upon completion the student should be able to:
  1. Describe the dual makeup of the photographic process
  2. Describe the characteristics of light
  3. Define reflection, absorption, transmission, and refraction
- B. Units of instruction
  1. Technical skill
     a. Exposing
     b. Developing
     c. Printing
  2. Picture content
     a. Subject
     b. Composition
  3. Characteristics of light
- C. Laboratory
  None

II. Camera Types and Utilization
- A. Performance objectives
  Upon completion the student should be able to:
  1. List and describe the primary parts of a camera
  2. Distinguish between and describe the advantages and limitations of primary camera types
  3. Load, focus, adjust, and operate various types of cameras and identify the controls for each
- B. Units of instruction
  1. The basic camera and types
     a. Basic camera components
     b. Types — operating principles — advantages and limitations

(1) Box camera
(2) 33 mm. camera
(3) 2-1/4 camera
(4) View camera

e. Selecting the right camera

2. Camera care and handling
   a. Loading the camera
   b. Holding the camera properly
   c. Focusing
   d. Operating the shutter
   e. Camera care and maintenance

C. Laboratory

Laboratory exercises and demonstrations to provide experience in loading, adjusting, focusing, and handling cameras

III. Photographic Processes

A. Performance objectives

Upon completion the student should be able to:

1. Expose and develop black and white sheet film and describe effects of exposure and development variations
2. Make and process contact prints by standard procedures
3. Describe the relationships between print exposure, quality, density, and negative contrast
4. List the standard materials, steps, and procedures for black and white sheet film and print processing
5. List and describe the principle camera exposure controls
6. Make exposure calculations using a light meter
7. Evaluate the effects of exposure variations on black and white films
8. Using a light meter and 18% gray card and calculations properly expose roll film
9. Set exposure controls according to the exposure calculations to correctly expose film
10. List the purpose of different focal length lens and applications of each
11. Describe different types of film and uses of each
12. Describe the common types of photographic paper and the uses of each
13. Describe the characteristics of photographic paper
14. Describe the relationship of contrast control filters on print contrast and exposure
15. Produce correct density, correct contrast, prints
16. Describe the characteristics of effective architectural photography
17. Describe the principles of light and optics
18. Care for and clean lens
19. Describe the effects created by different focal length lens
20. Use different focal length lens to expose film under various controlled conditions
21. Adjust print exposure for changes in magnification
22. Plan, storyboard, and produce photographic essays illustrating a campaign, group activities, and instructional sequence
23. Describe the negative characteristics that make dodging and printing-in desirable
24. Make corrected prints using the techniques of dodging and printing-in
25. Correctly expose and tank process roll film under various daylight situations
26. Use contact print sheets for negative evaluation
27. Make projection prints from exposed negatives
28. Expose and process prints
29. Dry mount photographic prints
30. Spot black and white prints
31. Describe the characteristics of film
32. Describe the principles of light and optics
33. Calculate exposure under a number of lighting conditions using different types of film
34. Select the proper film for a given situation
35. Describe the effects of chemicals on photographic paper

B. Units of instruction

1. Exposure control and calculations
   a. Aperture — purpose in relation to f/stop
   b. Shutter speed — purpose in relation to film types
   c. Relation of f/stop to shutter speed
   d. Basic calculation of exposure with light meter — choosing aperture opening vs. shutter speed, etc.
2. Lenses
   a. Principles of light in photography

b. Focal lengths of lenses
c. Lens "speed"
d. Depth of field
e. Lens care
f. Parallax
g. Problems in changing lenses vs. shutter speed
h. Automatic lenses
i. Costs

3. Films
   a. Types and sizes (35 mm.; 2-1/4 sheet)
   b. Characteristics
      (1) Speed
      (2) Grain
      (3) Contrast
      (4) Color sensitivity
   c. Film selection
4. Film processing — black and white
   a. Film processing
   b. Processing equipment
5. Making a photographic print — black and white
   a. Basic principles of printing
   b. Equipment
      (1) Contact
      (2) Enlarging
   c. Photographic papers
   d. Evaluating of prints

C. Laboratory

Laboratory exercises to provide:

1. Experience with film development variations and processing of exposed black and white film. Exposure under controlled conditions
2. Experience with contact prints, print exposure, print processing
3. Experience in loading, adjusting, focusing and handling cameras
4. Exposure of roll film under various daylight situations
5. Processing of roll film
6. Projection printing using variable contrast
7. Producing effective photo-journalistic type portraits
8. Magnification changes and quality of prints
9. Planning, storyboarding, and production of a single concept photo-essay
10. Techniques of dodging and printing-in projection printing

IV. Lighting and Lighting Techniques

A. Performance objectives

Upon completion the student should be able to:

1. Describe the lighting effects obtained with existing light, on-camera flash, off-camera flash, bounce flash
2. Produce effective "record" type photographs using electronic flash
3. Use colored filters to render correct subject colors with black and white film
4. Use copy stand and light
5. Describe the uses and limitations of high contrast film
6. Bulk load film
7. Mount 35 mm. transparencies
8. Process high contrast film
9. Opaque or spot high contrast film
10. Prepare 35 mm. transparencies using high contrast
11. Prepare overhead transparencies using high contrast film
12. Discuss the effects of developers on high contrast film
13. Prepare mechanicals and produce title graphics
14. Make mechanicals and transparencies for circle captions, caption arrows, and superimpositions
15. Produce overhead transparencies on fine grain positive film

B. Units of instruction

1. What is light — theory of light
2. Light sources and color transparencies
3. Film selection and light source
4. Filters, kinds and uses
5. Copy stands and light control

C. Laboratory

Laboratory exercises providing experience with:

1. Setup and use of different types of lighting
2. Exposing different types of film under different lighting conditions
3. Use, processing and application of high contrast film
4. Transparencies from fine grain positive film
5. Preparation of mechanicals for title graphics
6. Additional camera techniques of black and white photography
7. Use of copy stands and copy stand light control

V. Small Object Photography

A. Performance objectives

Upon completion the student should be able to:

1. List and describe the problems of small object photography
2. Use different types of equipment (close-up lens, bellows, macro lens, etc.) to setup, light and photograph small objects

B. Units of instruction

1. Purpose and problems of small object photography
2. Close-up and supplementary lens
   a. Determining exposures
   b. Advantages and disadvantages
3. Extension tubes and bellows
4. Determining exposure

C. Laboratory

1. The student is assigned projects to photograph a number of objects in the studio under controlled lighting and in the field under available lighting conditions using supplementary lens, macro lens, bellows and extension tubes
2. The student develops a report on the advantages and limitations of each system

VI. Color Photography

A. Performance objectives

Upon completion the student should be able to:

1. Describe the theory of additive and subtractive color

B. Units of instruction

1. Composition of white light
2. Color forming system
   a. Additive color mixture
   b. Subtractive color mixture

C. Laboratory

None

VII. Reversal Color Film Processing

A. Performance objectives

Upon completion the student should be able to:

1. List the steps in processing color reversal film
2. Describe the chemical reaction of each chemical in the process
3. Process color reversal film
4. Evaluate processed color reversal film

B. Units of instruction

1. Theory of reversal film
2. Steps of processing
3. Types of film and processes
4. Evaluating processed film
   a. Visual
   b. Densitometer

C. Laboratory

Laboratory exercises providing experience in:

1. Exposing color reversal film under different lighting conditions
2. Processing exposed film with a control strip
3. Evaluating processed film in regards to exposure, processing, contrast, and color balance

Texts and References

Boucher. *Fundamentals of Photography*

Craig. *Learning Photography*

Horder. *The Manual of photography; formerly the Ilford manual of photography.*

Rhode, and McCall. *Introduction to Photography*

Eastman Kodak Company. *Black and White Films in Rolls, Enlarging in Black and White, Producing Slides and Filmstrips.*

Related Media

Eastman Kodak Company, Audio Visual Service, 343 State Street, Rochester, New York 14650

Filters for Sky and Haze Control. SL, color or b & w.

Summary: Shows beginning photographer how filters are used to improve pictures taken on black and white film.

Pictures with Flash and Flood. slides, c or b & w, 50 sl.

Summary: Emphasizes when and how to use flash-gun lighting. Presents simple lighting arrangements for informal portraits with photoflood lamps.

Audiovisual Services, Arizona State University, Tempe, Arizona 85281

Roll Film Development. filmstrip, cassette tape

Summary: The equipment and procedures for the daylight tank method of roll film development are identified. The mixing and use of the chemicals for film development are explained. Removal of the film from the magazine or paper backing and loading into the reel and tank is described. The film development processes is covered in detail.

Making a Contact Sheet. filmstrip, cassette tape

Summary: The steps in the making of a contact sheet are demonstrated. The contact sheet is discussed as an evaluative tool in discerning negative quality and determining future possibilities for printing specific negatives. The equipment necessary to make a contact sheet, the necessary chemicals, and the procedures involved are presented and explained.

Enlarging — Part I. filmstrip, cassette tape

Summary: The parts of the enlarger are identified. The manipulations of the controls are demonstrated. Two methods of exposing a test print are ex-

plained and demonstrated. The complete developing process is explained.

Enlarging — Part II. filmstrip, cassette tape

Summary: The manipulation of the enlarger and accessory equipment is demonstrated for these printing controls: cropping, printing in, dodging, print distortion control, diffusion and multiple printing.

Enlarging — Part III. filmstrip, cassette tape

Summary: The use of chemicals for print control is explained and demonstrated. Using more than one variable contrast filter on a print is demonstrated. Print defects are identified and their relationship to print quality is explained.

DESIGN AND GRAPHICS FOR MEDIA

Hours Per Week
Class, 2; Laboratory, 6

Description

This course provides the basic aesthetic understanding and technical skills needed to become a designer for media. Here the student explores the source of design inspiration and principles fundamental to all visual media. The student acquires expertise in handling the tools of design and graphics progressing from freehand sketching to the fundamentals of drafting. Through projects the student combines design sense and "tool" ability in solving media design problems.

Major Divisions

	Hours	
	Class	Laboratory
I. The Vocabulary of Visual Images	2	6
II. Composition of Picture Making	2	6
III. Analyzing Pictures	2	4
IV. Drawing and Sketching	4	10
V. Introduction to Drafting	4	6
VI. Lettering Techniques	4	15
VII. Orthographic Projections	2	10
VIII. Pictorial Drawing	2	10
IX. Charts and Graphs	4	10
X. Design for Various Formats for Media	2	4
XI. Design Limitation of Media Graphics	2	0
XII. Production of Graphics for Media	2	15
Total	32	96

I. The Vocabulary of Visual Images
A. Performance objectives
Upon completion the student should be able to:
1. Describe visual awareness
2. List the basic elements of design

B. Units of instruction
1. The need for visual awareness
2. Taste or expression of visual materials
a. Reflection of time
b. Reflection of social attitude
3. Basic design elements
a. Line
b. Form
c. Texture
d. Color
e. Shape
f. Balance

C. Laboratory
The student is required to do a research paper on the change of taste and expression for three distinct periods. The student discovers and identifies the basic design elements in several instructor-selected visual materials

II. Composition of Picture Making
A. Performance objectives
Upon completion the student should be able to:
1. Illustrate the difference between object and picture border
2. Define and illustrate flat space
3. Define and illustrate perspective
4. Illustrate difference between positive and negative space
5. Define and illustrate difference between formal and informal balance

B. Units of instruction
1. Picture border
a. Define picture border
b. Relation of objects to a border
2. Flat space vs. perspective
a. Illustrate examples of flat space
b. Illustrate examples of perspective space
c. Develop a comparison of flat to perspective space
3. Positive and negative space
a. Objects are usually positive space and background negative space
b. The influence of picture border on positive and negative space
4. Balance
a. Two kinds of balance
(1) Formal
(2) Informal
b. Theory of balance
(1) Rule of thirds
(2) Coalyard balance

C. Laboratory
Student does an exercise in object relationship to border. Three triangles are moved about on a rectangular piece of paper to discover the variety of relationships of objects to borders and ob-

jects within a picture border
He prepares three layouts
The student performs an experiment on the rule of thirds. A picture border is created by dividing a rectangular sheet of paper in thirds both eays — three geometric shapes are placed at various points of line intersection on this border and relationships of object balances observed
Layouts prepared with student's observation and comment on relationships

III. Analyzing Pictures
A. Performance objectives
Upon completion the student should be able to:
1. Analyze and break up space with line
2. Analyze and break up space with geometric shape
3. Analyze and break up space by tone
4. Analyze and break up space by color
B. Units of instruction
1. Breakup of space by line
2. Breakup of space by geometric shape
3. Structure of space with tone
4. Color
5. Comparison of the various methods of analyzing space to original subject
C. Laboratory
The student develops a set of overlays from an instructor-supplied color reproduction, analyzing the picture for special structure by line, tone, geometric shape, and color. The student then compares and reports on the relation of the overlays to each other and to the original

IV. Drawing and Sketching
A. Performance objectives
Upon completion the student should be able to:
1. Draw and sketch from nature, model, and still life with various media (pen, brush, etc.) using various types of paper
B. Units of instruction
1. Media for drawing: pencil, pen and ink, brush
2. Papers for drawing: newsprint, bond, watercolor
3. Subjects for drawing: from nature, from models, from still life
4. Freehand sketching
C. Laboratory
Have a student experience as many different types of drawing media (pen, brush, etc.) and papers and combinations as possible by doing a number of drawings from still life, models, and nature

V. Introduction to Drafting
A. Performance objectives
Upon completion the student should be able to:
1. Describe the tools used by a draftsmen and define their use
2. Use his tools to construct a number of useful geometric shapes
B. Units of instruction
1. Types of drafting and drafting tools
2. Geometric constructions
3. Dimensional methods
C. Laboratory
Provide laboratory exercises through which the student acquires the ability to use various drafting tools
Provide exercises which will give the student practice in basic drafting techniques

VI. Lettering Techniques
A. Performance objectives
Upon completion the student should be able to:
1. Describe the different types of lettering
2. Letter, using every type of lettering listed
B. Units of instruction
1. Hand lettering
2. Speedball pens
3. Mechanical tracing lettering systems
4. Plastic and metal stencil lettering
5. Lettering standards
C. Laboratory
Provide laboratory exercises in lettering using a number of techniques, hand lettering and mechanical lettering, that will be used in preparing drawings and in future courses

VII. Orthographic Projections
A. Performance objectives
Upon completion the student should be able to:
1. Develop an orthographic drawing from an object
B. Units of instruction
1. Developing a drawing from an object
2. Reducing to necessary views
C. Laboratory
Start with a simple object (rectangular box) and have the student develop it into a

drawing showing all sides and then reduce it to the minimum number of views needed; then have the student repeat the above with a more complex object

VIII. Pictorial Drawing
- A. Performance objectives
  Upon completion the student should be able to:
  1. Using orthographic projection, draw an object in isometric
  2. Using orthographic projection, draw an object in perspective
- B. Units of instruction
  1. Developing a drawing from an object
  2. Reducing to necessary views
- C. Laboratory
  Provide laboratory exercises with simple orthographic projections and from this produce an isometric, oblique, and cabinet view and a number of different perspective views

IX. Charts and Graphs
- A. Performance objectives
  Upon completion the student should be able to:
  1. Describe the different types of charts and graphs
  2. From information given construct any one of these graphs or charts
- B. Units of instruction
  1. Types and uses of graphs
     a. Line graph
     b. Bar graph
     c. Area graph or pie graphs
  2. Types and uses of charts
     a. Flow chart
- C. Laboratory
  From instructor-supplied information the student develops graphs and charts of various types including line, bar, and area graphs

X. Design for Various Formats for Media
- A. Performance objectives
  Upon completion the student should be able to:
  1. List all the various media that use design
  2. Describe the format for each media
- B. Units of instruction
  1. Printing
  2. Television
  3. Slides (35 mm.)
  4. Motion pictures
- C. Laboratory
  Through lecture demonstration:
  1. The student is shown a wide variety of graphics used in media
  2. Survey of the various processes involving photocopy, offset printing, television, film is presented

XI. Design Limitation of Media Graphics
- A. Performance objectives
  Upon completion the student should be able to:
  1. List the various limitations for each media he will be working with
- B. Units of instruction
  1. Size and proportion
  2. Tonal scale and color
  3. Budget
- C. Laboratory
  None

XII. Production of Graphics for Media
- A. Performance objectives
  Upon completion the student should be able to:
  1. Plan graphics for any media
  2. Produce graphics for any media
- B. Units of instruction
  1. Planning of graphics
  2. Production of graphics
  3. Conversion of graphics to slides, film, television, vs. printed matter
- C. Laboratory
  At this point assign a number of comprehensive projects for the student to solve for various formats. The student should keep in mind that they should draw from all the previous work in this course to produce these graphics

Texts and References

Bevlin. *Design Through Discovery.*
Bockus. *Advertising Graphics; a workbook and reference for the advertising artist.*
Cataldo. *Graphic Design and Visual Communication.*
Giachino. *Drafting Technology.*
Laughton. *Television Graphics.*
Stone. *Preparing Art for Printing.*

Related Media

Hester and Associates, 11422 Harry Hines Blvd., Suite 212, Dallas, Texas 75229
A New Look at Design I. super 8 film loop, color
A New Look at Design II. super 8 film loop, color

A New Look at Design III. super 8 film loop, color
Summary: the three films use the technique of selection or changing perspective to investigate our environment.
Awareness Where I Live. super 8 film loop, color
Summary: A visual survey of different types of housing in large cities and in rural areas.
Awareness of Water. super 8 film loop, color
Summary: The aesthetic and functional properties of water are presented in a series of scenes which illustrate the impact of water on our society.
Awareness of Sky. super 8 film loop, color
Summary: A presentation of visually exciting forms and colors that make up the sky. The elusive shapes of the continually changing compositions are emphasized.
Awareness of Rain. super 8 film loop, color
Summary: Rain and all its different visual aspects are explored in this film. Close-ups of subtle happenings during a rainstorm and the aftermath of the storm are recorded to reveal a sensitive visual statement.
Awareness of Close-Ups. super 8 film loop, color
Summary: A film on the concept of distortion and redefinition of objects, by the camera moving in very tight (or "close-up") to the subject. This film gives the viewer clues to new ways of looking at common-place objects and hints of their visual richness.
Lettering With Guides. super 8 loops
Summary: Through the use of a Wrico Lettering Set, this film shows the teacher procedures for obtaining professional quality lettering. 4:10
Caution in the Use of Instruments. super 8 loops.

Scope Production Incorporated, Educational Division, 1461 W. Shaw Avenue, Fresno, Calif. 93705
Texture. super 8 film loop
Space Division. super 8 film loop
Focal Point. super 8 film loop
Aspect Ratio. super 8 film loop
Scale. super 8 film loop
Rhythm. super 8 film loop
Basic Educational Graphics. 10 sound film strips in color. Educational Media Laboratories, 4101 S. Congress Avenue, Austin Tex. 78745.

McGraw-Hill Company, Webster Division, Manchester, Mo. 63011
Drafting General. super 8 loops
Drawing Tools Part I. super 8 loops
Drawing Tools Part II. super 8 loops
Isometric Drawing. super 8 loops. Sterling Educational Films, Inc., 241 E. 34th Street, New York, N.Y. 10016.

Bailey Films, 6509 Delongpre Avenue, Hollywood, Calif. 90028
Learning to Look. 6 sound film strips in color
Exploring Art Techniques. 4 sound film strips in color
Instructional Graphics for Television. multimedia kit. Technifax Education Division, The Plastic Coating Corporation, Holyoke, Mass. 01040.
Art Instruction. overhead transparencies. Scott Education Division, Scott Paper Industries, Holyoke, Mass. 01040.

FILMMAKING

Hours Per Week
Class, 2; Laboratory, 8

Description

The student is introduced to film production. Emphasis is placed on the making of instructional films in the SUPER 8 FORMAT. Students are given individual projects in developing the single-concept films. These projects include both silent and sound films. Films of all types are shown to assist in understanding of the makeup of film.

Major Divisions

	Hours	
	Class	Laboratory
I. Introduction to Motion Pictures	1	0
II. The Camera	4	8
III. Types of Film Productions	2	0
IV. Film Planning	4	15
V. Film Production	2	35
VI. Editing	4	25
VII. Single-Frame Techniques	3	15
VIII. Custom Laboratory Services	4	0
IX. Sound, Post-Recording Techniques	4	14
X. Projectors and Projection Systems	3	16
Total	32	128

I. Introduction to Motion Pictures
A. Performance objectives
Upon completion the student should be able to:
1. Describe the illusion of motion
2. Describe the historical development of film
3. Describe the relation of early silent film to instruction films
B. Units of instruction
1. The illusion of motion
2. Historical development
3. Relationship of early films to present instructional film productions
C. Laboratory
None

II. The Camera
A. Performance objectives
Upon completion the student should be able to:
1. List the various parts of a motion picture camera
2. Operate the various controls on a motion picture camera
3. Set up and use lighting equipment for filmmaking
B. Units of instruction
1. The camera
2. Camera operation and movements
3. Lighting
C. Laboratory
The student is assigned a set of projects which will enable him to understand the various controls of a Super 8 movie camera This camera will not contain film
The students will understand the camera operation for both automatic and manual exposures and use different types of camera supports. The students are assigned a series of simple operations which will enable them to observe visually the function of the various controls on a camera. This will be accomplished by having the students use a loaded camera and complete a series of prescribed operations, under both daylight and tungsten lighting. The processed film is evaluated by the student and instructor to insure the student has a working knowledge of camera controls.

III. Types of Film Production
A. Performance objectives
Upon completion the student should be able to:
1. List the different types of film productions
2. Describe the different types of film production
B. Units of instruction
1. Fictional
2. Educational
3. Documentation
4. Experimental
C. Laboratory
None

IV. Film Planning
A. Performance objectives
Upon completion the student should be able to:
1. Plan a film production using storyboard and log sheet and doing the

necessary research

B. Units of instruction
1. Storyboard
2. Film log sheet
3. Library — research

C. Laboratory
Have student plan and do research on the film production keeping in mind the following points:
Audience
Purpose
Essential material
Budget
Have the students produce the shooting script or storyboard cards from which film will be produced

V. Film Production
A. Performance objectives
Upon completion the student should be able to:
1. Using the storyboard, expose film called for in storyboard

B. Units of instruction
1. Studio
2. Location

C. Laboratory
Have the student bring together the necessary materials (props, lights, camera, etc.) and personnel called for in the script or storyboard to produce the film
Have the student produce and expose the necessary footage for the film
Film processed by commercial laboratory

VI. Editing
A. Performance objectives
Upon completion the student should be able to:
1. List the steps in editing a film
2. Use an editor and splicer to edit film

B. Units of instruction
1. Splicing
2. Using log sheet to build film

C. Laboratory
Using the following steps, edit and splice processed film from previous production
Review script or storyboard cards
View footage in editor
Cut footage to length for various shots
Splice the shots together in order as called for by the script or storyboard
Using film cleaner, clean film before projecting or having print made
All films are critiqued

VII. Single-Frame Techniques
A. Performance objectives
Upon completion the student should be able to:
1. List the different single-frame techniques
2. Set up and use copy lighting
3. Make single-frame sequence of film

B. Units of instruction
1. Animation
2. Titling
3. Time lapse

C. Laboratory
Using one of the following techniques, produce title graphics for the film production
Dry-transfer letters
Letterpress
Hot-press
Hand lettering
Existing signs
Three-dimensional letters
Superimposition
Use standard copy lighting in converting graphics to film
Produce an animated film using one of the following techniques:
Cel animation
Object animation
Filmograph technique
Cutouts
Pick a subject for time-lapse photography (flowers, sunset, traffic patterns, etc.) and either manually or by use of time-lapse timer make a time-lapse sequence

VIII. Custom Laboratory Services
A. Performance objectives
Upon completion the student should be able to:
1. List the services provided by custom film lab
2. Describe these services

B. Units of instruction
1. Film processing
2. Film duplication
3. Soundstripping

C. Laboratory
None

IX. Sound, Post-Recording Techniques
A. Performance objectives
1. Describe the sound record process
2. Record sound
3. Mix sound

4. Re-record it onto soundstrip film

B. Units of instruction
   1. Taping
   2. Soundstripping
   3. Mixing
   4. Narration
   5. Sound effects

C. Laboratory

Send edited film to processor for soundstripping

Record on tape narration as per script

Pick out background music for soundtrack

Using an audio mixer, re-record narration over background music or sound effects to produce master soundtrack

Using soundstripped film and a projector that can record sound, add sound to the film

X. Projectors and Projection Systems

A. Performance objectives

Upon completion the student should be able to:

1. List the different projector systems
2. Describe how the projector system will determine how the film is produced

B. Units of instruction
   1. Types of projector
   2. Designing film for projector

C. Laboratory

Study the various projector and projector systems (reel, loop, cartridge, etc.)

Do the necessary editing, splicing, coding, and spooling to fit the various projectors studied

Texts and References

Eastman Kodak Company. *Movies With a Purpose.*
Mascelli. *The Five C's of Cinematography.*

Related Media

Association for Educational Communications and Technology, 1201 16th Street, N.W., Washington, D.C. 20036.
Rhetoric of the Movie. six 50' films and teacher's guide.
Growing of a Young Film Maker. 17 min., 16 mm., film.

Eastman Kodak Company, Audio Visual Services, 343 State Street, Rochester, N.Y. 14650.
A Filmography of Films About Movies and Movie-Making.
Motion Picture Production — Basic Lighting. 5 min., 16 mm., color, sd., 1971.
Summary: Shows the basic elements of lighting including intensity, direction, specularity.
Worth How Many Words. 8 min., 16 mm., color, sd.
Summary: Demonstrates the power of film to reveal and probe in an unsurpassed fashion.
Movies Move People. 30 min., 16 mm., color, sd.
Summary: Segments demonstrate how movies are used to cope with communication problems typical of the business world. Examples relate how movies, can be used to sell, train, motivate, persuade, enhance, etc.
Super 8 — A Unique Communication System. 30 min., multimedia program.
Summary: Presents the many advantages of using Super 8 films and projectors as communication tools.

Hester and Associates, 11422 Harry Hines Boulevard, Dallas, Texas 75220.
Animation Flip Card.
Animation Study Board.
Animation Single Frame. super 8 loops.
Animation Paste Up. cover.
Animation Gallery.
Television Commercial.

International Film Bureau, Inc., 332 South Michigan Street, Chicago, Illinois 60604.
A Film About Filmmaking. 18 min., 16 mm., sd., color.
Summary: Covers basic techniques of filmmaking.

MEDIA PHOTOGRAPHY

Hours Per Week
Class, 0; Laboratory 6

Description

This course follows the photography course with laboratory experience in preparation of photographic media such as slides, filmstrips, and photographs. Principles of design and graphics are extensively used through preparation of mechanicals and artwork for slides and filmstrips. Conduct of the course provides practical experience in preparation of photographic media together with skill practice to develop technique, confidence, and production capabilities.

The course is conducted entirely as a laboratory or workshop experience. Review and expansion of principles of photography are provided through the projects.

The course is structured to provide two somewhat different types of experience. The first part concentrates on providing experience with the technical aspects of color transparency preparation working from both various types of reflection copy and transparencies for conversion to slide series and filmstrips. The second part of the course provides production techniques and simulation of design center operation utilizing both sophisticated and basic slides and filmstrip production facilities.

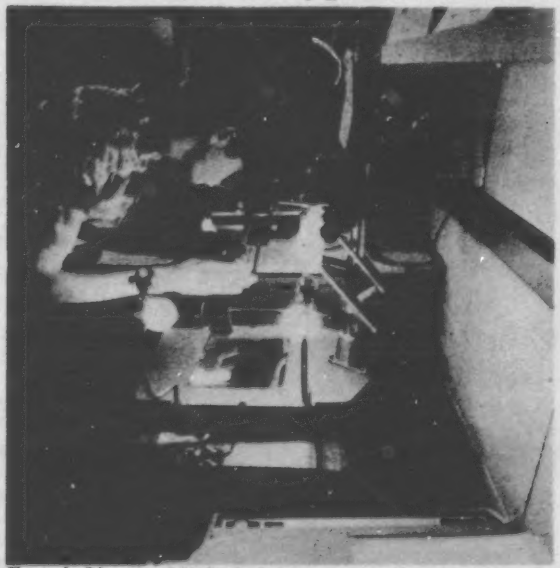

Figure 4—Educational Media Technicians prepare the artwork for original slides and filmstrips and prepare duplicates of all types of transparencies.

Major Divisions

	Hours	
	Class	Laboratory
I. Slide and Filmstrip Production and Duplication ..	0	32
II. Production Techniques	0	32
III. Sound Synchronizing Slides and Filmstrips	0	32
Total	0	96

I. Slide and Filmstrip Production and Duplication

A. Performance objectives

Upon completion the student should be able to:

1. Prepare a complete storyboard for production of a single concept slide series or filmstrip
2. Produce black and white frame images (print form)
3. Produce direct positive black and white transparencies
4. Prepare color frame images (print form)
5. Produce print to transparency conversions
6. Prepare mechanicals for title graphics
7. Produce title graphics using high contrast film
8. Prepare continuous tone reproductions
9. Use polorizing filters to control copy reflections
10. Prepare artwork and mechanicals to slide and filmstrip format
11. Crop artwork to improve composition
12. Prepare titles for slides by direct image, cell overlays or superimposure
13. Add color to high contrast film produced transparencies
14. Correct exposure, color balance, and contrast of slides
15. Duplicate slides and filmstrips
16. Reduce or enlarge frames to 35 mm.
17. Operate slide duplicating and processing equipment
18. Using slide duplicating and processing equipment, produce:
    a. Straight duplications
    b. Contrast corrections
    c. Magnification changes

d. Color corrections
e. Captions by multiple exposure and color captions
f. Color conversions
g. Title conversions

B. Units of instruction
1. Planning slide series and filmstrips
a. Evaluating the appropriate media
b. Define problem
c. Define audience
d. Define objectives
e. Prepare outline
f. Writing the script
g. Visual and audio relationships
h. Preparing the storyboard
2. Slide and Filmstrip production
a. Production techniques
b. Artwork
(1) Standard artwork paste-ups
(2) Photo design
c. Artwork standards
d. Photography
e. Sequence and continuity sheets
f. Slide, filmstrip, and television
g. Graphics
3. Slide and filmstrip copying equipment
a. Slide duplicating units
b. Copy tubes
c. Bellows and slidecopy unit
d. Copystand equipment
e. Half and full frame cameras
4. Types of film for copying and duplicating
5. Evaluating and correcting film
a. Color balance
b. Exposure
c. Contrast
d. Color conversion

C. Laboratory
Laboratory exercises to provide experience with:
1. Review of black and white photographic processes
2. Production of directed photographs
3. Black and white frame images
4. Planning and storyboarding slide series or filmstrips
5. Mechanical preparation for title graphics, artwork or mechanicals
6. Title slides by direct image, cell overlays or superimposure
7. Direct positive black and white transparencies
8. Direct positive film processing
9. Copystand lighting and copy lighting
10. Preparation of color frame images
11. Producing full frame transparencies
12. Concepts of color balance and light balancing filters
13. Producing color transparencies from prints
14. Use of color transparency film and processing
15. Production of duplicate slides, contrast corrected slides, color correction comparisons, magnification changes, caption frames, color caption frame, and color conversion
16. Conversion of slides to filmstrip

II. Production Techniques
A. Performance objectives
Upon completion the student should be able to:
1. Prepare slides of 3-dimensional objects
2. Prepare title and caption frame using various lettering techniques, lighting techniques, cell overlays, and superimposures
3. Copy prepared artwork
4. Render prepared artwork by cropping, color conversion, lighting, overlays, etc.
5. Prepare original artwork for slides, graphics, or filmstrips in proper format, bleed area and composition
6. Evaluate projectability of transparencies
7. Prepare effective off-copy board slides using various shooting techniques and approaches
8. Prepare filmstrips from slides by conversion of double to single frame using various light sources and facilities
9. Batch process transparency film
10. Develop production standards (film lighting, processing, format equipment) for resource center operation

B. Units of instruction
1. Artwork standards for slides and filmstrips
a. Copy limits
b. Bleed areas
c. Composing and cropping
2. Preparing titles and artwork
a. Title techniques
b. Composition and colors
c. Projection and image quality
d. Progressive disclosures

e. Overlays, backlighting, and filters
3. Off-copy board techniques
a. Objective and subjective approaches
b. Composition
c. Shooting techniques
4. Slide and filmstrip production techniques
5. Batch processing
6. Developing production standards

C. Laboratory

Laboratory exercises to provide production experience in:

1. Preparation of artwork for slides or filmstrips
2. Exposing film from reflection copy and transparencies
3. Production scheduling and coordination
4. Rendering artwork using both elaborate and basic facilities and techniques
5. Duplicating slides, filmstrips, and film processing

III. Sound Synchronizing Slides and Filmstrips

A. Performance objectives

Upon completion the student should be able to:

1. Prepare a script or narration for a slide series or filmstrip
2. Operate equipment to record the delivered narration
3. Produce sound synchronized slide series and filmstrips using both audible and inaudible cues
4. Explain briefly the current pulse cue standards for audio recording
5. Describe basic equipment that will provide satisfactory audible cues
6. Prepare audio tapes for sound synchronized slides or filmstrips including narrations, audio mixes, and cues
7. Briefly describe recording and pulsing systems found in common recorders, playback, and projectors

B. Units of instruction

1. Scripts and narrations
2. Audio recording procedures
a. Disc recording
b. Tape recording
c. Audio characteristics
d. Audio pulse standards
3. Audio recording equipment
a. Monaural
b. Sterophonic
c. Audio mixes
d. Audio quality

C. Laboratory

Laboratory exercises to provide experience in:

1. Preparation of scripts and narrations for audio slide series and filmstrips
2. Operation of equipment to sound synchronize slides or filmstrips using both audible and inaudible cues, and audio mixes

Texts and References

Eastman Kodak Company. *Producing Slides and Filmstrips.*
Minor. *Techniques for Producing Visual Instructional Media.*
Murgio. *Communications Graphics.*

Related Media

Eastman Kodak Company, Audio Visual Services, 343 State Street, Rochester, N.Y. 14650.
Basic Art Techniques for Slide Production. 14 min., 35 mm. slides, color, sd.
Summary: Outlines basic techniques used to prepare artwork for photographing into slides.

Bureau of Audio Visual Instruction, Board of Education of the City of New York, 131 Livingston Street, Brooklyn, N.Y. 11201
30 min., 16 mm., sd., b & w, 1964.
Summary: Film demonstrating effective use of projected slides.

Great Plains National Instructional T.V. Library, University of Nebraska, Lincoln, Nebraska 68508.
Television Graphics. 13-18 min., 16 mm., sd., b & w.
Words and Labels. 13-28 min., 16 mm., sd., b & w.
Summary: Presents elevision graphics and visual materials.

Ampex Corporation, 401 Broadway, Redwood City, California 94063.
Visuals and Graphics for Monochrome T.V. 20 min., videotape, 1 or 1/2 in., b & w. 1970.
Summary: Training tape for television production, preparation of support materials.

BFA Educational Media, 11559 Santa Monica Blvd., Los Angeles, California 90025.
4 - 55 frs., filmstrip, color, sd., recorder cassette.
Summary: Explains in detail the methods and equipment used for close-ups and copying flat matter and slides.

EDUCATIONAL MEDIA TECHNIQUES

Hours Per Week
Class, 2; Laboratory, 6

Description

Above and beyond design courses there are certain techniques and functions that characterize preparation of visual material for educational media. Most of these techniques are skilled oriented with great stress applied to their proper use. Principally these skills include mounting, laminating, preparation of overhead transparencies, and the various forms of display media. Upon completion of the course each student will have prepared a wide variety of these items, including various techniques of mounting pictures, cold and hot lamination as well as thermo, dry photo and diazo transparencies. The completed project will be evaluated in terms of design and balance considerations established in earlier courses.

The laboratory sessions consist of problems whose solutions use one or many media techniques. The assignments are designed to give a realistic atmosphere of a media preparation center.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Mounting and Laminating	2	4
II. Overhead Transparency Production	15	46
III. Display Media	15	46
Total	32	96

I. Mounting and Laminating
- A. Performance objectives
  Upon completion the student should be able to:
  1. Prepare graphic materials using the cold mounting technique.
  2. Prepare graphic materials using the wet mounting technique
  3. Prepare graphic materials using the hot mounting technique
  4. Prepare laminated materials using the cold technique
  5. Prepare laminated materials using the hot technique
- B. Units of instruction
  1. Mounting
     - a. Cold
       (1) Identify materials
       (2) Identify tools and equipment used
       (3) Problems in processing materials
     - b. Wet
       (1) Identify materials
       (2) Identify tools and equipment used
       (3) Problems in processing materials
     - c. Hot
       (1) Identify materials
       (2) Identify tools and equipment used
       (3) Problems in processing materials
  2. Laminating
     - a. Cold
       (1) Identify materials
       (2) Identify tools and equipment used
       (3) Problems in processing materials
     - b. Hot
       (1) Identify materials
       (2) Identify tools and equipment used
       (3) Problems in processing materials
- C. Laboratory
  Prepare a set of four tearsheet pictures using the cold mounting technique
  Prepare a set of four tearsheet pictures using the wet mounting technique
  Prepare a set of four tearsheet pictures using the hot mounting technique
  Prepare a cold lamination of one of the cold mounted pictures

II. Overhead Transparency Production
- A. Performance objectives
  Upon completion the student should be able to:
  1. Develop handmade overhead transparency projectuals using clear acetate and frosted acetate
  2. Develop machine-made transparencies using the picture transfer technique, spirit duplicator, diazo, thermo, photocopy, electro-static and high-contrast photography
  3. Properly implement the overlay technique
- B. Units of instruction
  1. Handmade transparency production
     - a. Clear acetate
       (1) Materials
         (a) Acetate

(b) Reprocessed X-ray film
(c) Grease pencils
(d) Flow pens
(e) Transfer tapes
(f) Transfer patterns
(g) Other
(2) Design and artwork standards
b. Frosted acetate
(1) Materials and technique of use
(a) Frosted acetates
c. Overlay techniques
(1) Hinging
(a) Mylar hinges
(b) Staples
(2) Slide
(a) Tracks
(b) Mounting of tracks
(3) Registration of cell over cell
d. Picture transfer transparencies
(1) Materials and technique of use
(a) Cold adhesive film
(b) Hot adhesive film
(c) Rubber cement
(2) Advantages and disadvantages
2. Machine-made transparency production
a. Spirit duplicator
(1) Theory of operation
(2) Spirit master preparation
(3) Acetate
(4) Spray coating
(5) Advantages and limitations
(6) Costs
b. Diazo
(1) Theory of operation
(2) Chemistry of diazo
(3) Concept of opaqueness
(4) Diazo film
(5) Advantages and limitations
(6) Costs
(7) Graphics design and artwork standards
c. Thermo
(1) Theory of operation
(2) Thermo film
(3) Advantages and limitations
(4) Costs
(5) Graphic design and artwork standards
d. Photocopy
(1) Theory of operation
(2) Materials
(3) Advantages and limitations
(4) Costs
(5) Graphic design and artwork standards
e. Electrostatic
(1) Theory of operation
(2) Materials
(3) Advantages and limitations
(4) Costs
(5) Graphic design and artwork standards
f. High-contrast photography
(1) Theory of operation
(2) Materials
(3) Advantages and limitations
(4) Costs
(5) Graphic design and artwork standards
3. Student presentation of completed transparencies

C. Laboratory

Laboratory periods are devoted to the development of original artwork for the preparation of overhead transparencies using all the techniques typically found in a media production center.

The following transparencies should be prepared:

1. Preparation of an overhead transparency graphic on a spirit master and processing through the spirit duplicator on acetate
2. Preparation of a diazo master that indicates to the student the various materials suitable in master preparation
3. Preparation of a series of diazo masters on a likely topic requested by faculty
4. Preparation of a master suitable for processing through a thermocopier
5. Preparation of an overhead transparency from an original piece of work using the dry photocopier
6. Preparation of an overhead transparency from an original piece of work using the electrostatic copier
7. Preparation of artwork for a set of transparency masters that will be shot using high-contrast film

III. Display Media

A. Performance objectives

Upon completion the student should be able to:

1. Prepare flat displays such as bulletin boards, flannel boards, magnetic boards, posters, and flip charts

2. Prepare three-dimensional displays such as tabletop, models, mockups, dioramas, and showcase display

B. Units of instruction
   1. Display
      a. Flat
         (1) Bulletin boards
         (2) Flannel boards
         (3) Magnetic boards
         (4) Posters
         (5) Flip charts
      b. Three-dimensional
         (1) Table
         (2) Models
         (3) Mockups
         (4) Diorama
         (5) Showcase display
   2. Display considerations
      a. Characteristics of display
      b. Advantages and limitations
      c. Display design

C. Laboratory

From a list of topics the students select two that they will design and implement into two of the following:

1. Table display
2. Showcase display
3. Model
4. Mockup
5. Diorama

Texts and References

Kemp. *Planning and Producing Audio Visual Materials.*

Minor, and Frye. *Techniques For Producing Visual Instructional Media.*

Related Media

Chandler Publishing Company, 124 Spear Street, San Francisco, California 94105
Chandler produces a series of 8 mm. single-concept films on topics directly related to this course.

Hester and Associates, 1142 Harry Hines Blvd., Dallas, Texas 75229
Hester produces a series of booklets on topics directly related to this course.

Instructional Media Center, University of Texas at Austin, Drawer W — University Station, Austin, Texas 78712.
The University of Texas produces a series of booklets on topics directly related to this course.

Keuffel and Esser, 20 Whippany Road, Morristown, N.J. 07960
In the "Instructional Media" master book there are several transparency masters directly related to the topics in this course.

McGraw-Hill Book Company, Textbook-Film Division, 330 W. 42d Street, New York, N.Y. 10036.
McGraw-Hill produces a series of 8 mm. single-concept films on topics directly related to this course.
Major 16 mm. film libraries have in their collection films on:
a. The overhead projector
b. Diazo transparency production
c. Dry mounting instructional materials
d. Display media

MEDIA EQUIPMENT OPERATION AND MAINTENANCE

Hours Per Week

Class, 2; Laboratory, 4

Description

This course provides experience with setup, operation, service, and repair together with study of the operating principles, applications, and utilization of media equipment. The characteristics, advantages, and limitations of various types of equipment and related media are examined. Specifications of equipment, purchasing procedures, and equipment costs are considered in relation to utilization and facilities.

Basic information and fundamental principles are presented in class lectures, demonstrations, and mediated instruction. Laboratory activities are emphasized and provide skill training and the problems of its acquisition, distribution, and control. The role and function of the media technician in regard to management of equipment services are emphasized.

This course relies heavily upon the principles and concepts presented in media physics. The technical content of the course depends upon the mathematics and science background of the students and may be modified to match the level of technical background. Fundamental principles of media physics are applied to equipment and expanded through consideration of the technical aspects of equipment. This course provides the basic knowledge of equipment details for the management of media and resources. Sufficient technical background and skills are developed to enable some students to continue technical studies in the areas of basic electricity and electronics.

Basic electrical and electronics principles are sometimes difficult to present to nontechnically oriented students. It is recommended that many of the skills, instrumentation techniques, and principles be presented through fabrication projects such as an audio amplifier or intercom system. Such experiences encompass both fabrication and testing techniques in an interesting and motivating manner.

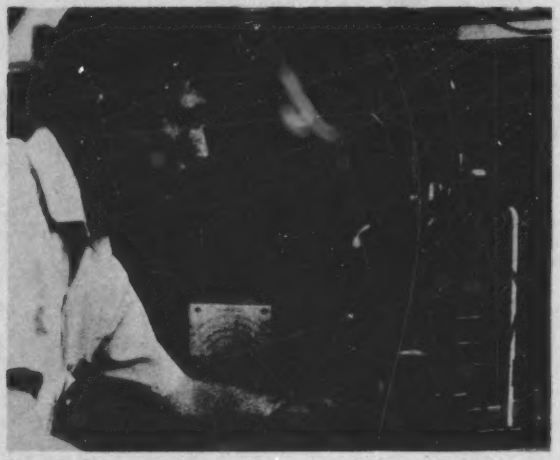

Figure 5—Basic repair, maintenance, operation and distribution of media equipment is one of the many responsibilities of the Educational Media Technician.

Major Divisions

	Hours	
	Class	Laboratory
I. Electrical Principles and Practice	6	12
II. Principles and Equipment for Audio Recording and Reproduction	6	8
III. Principles of Projection	4	8
IV. Still Projection Equipment	5	10
V. Motion Picture Projectors	4	10
VI. Equipment for Individualized and Programmed Instruction	3	6
VII. Specifications of Spaces, Equipment, and Materials	4	10
Total	32	64

I. Electrical Principles and Practice

A. Performance objectives

Upon completion the student should be able to:

1. Describe in writing and verify by basic experimentation the characteristics and components of series and parallel d.c. and a.c. circuits
2. List, differentiate between, and describe common electrical distribution systems
3. Given an equipment list and specifications, determine the distribution circuit and circuit protection devices required
4. Use common fabrication and repair

hand tools in completion of practice projects or repair projects
5. Use basic circuit test equipment in analysis of simple circuits and equipment components
6. Describe briefly the symptoms or characteristics of common electrical service problems in media equipment
7. Diagnose service problems and correctly use test or repair tools to correct common service problems in media equipment
8. Draw and interpret basic schematic or wiring diagrams for power, protection, and control

B. Units of instruction
1. Principles of d.c. and a.c. electricity
2. Source of power
3. Series and parallel circuit characteristics d.c. and a.c.
4. Circuit protection device and characteristics of each
5. Circuits of electrical distribution
6. Control circuit components
7. Circuit representation
   a. Schematics
   b. Wiring diagrams

C. Laboratory
1. Lecture demonstrations introducing common hand tools, fabrication practices, and supplies
2. Laboratory exercises requiring the use of hand tools. (Example: a hole in a chassis, soldering on printed circuit boards, installing solid-state devices using heat sinks)
3. Practice in using ohmmeter, voltmeter, ammeter, and wattmeter
4. Laboratory exercises to introduce circuit testing and checking principles. This will include both series and parallel d.c. and a.c. exercises (Example: Assembly and testing of boice transmitters, intercom, public address system or electric eye, guitar amplifier, monophonic phonograph, etc.)

II. Principles and Equipment for Audio Recording and Reproduction

A. Performance objectives

Upon completion the student should be able to:

1. List and define the basic terminology of sound for common audio recording and reproduction equipment
2. List and briefly describe the major component controls and functions of each
3. List and indicate the characteristics and limitations of various types of audio recording or reproduction equipment components
4. List and briefly describe the primary selection criteria for audio equipment or components
5. Set up and operate various types of audio recording or reproduction equipment
6. Describe the normal maintenance procedures for common audio recording or reproduction equipment
7. Diagnose and repair common faults in audio recording or reproduction equipment
8. Fabricate or specify patch cords for connection of audio equipment or circuits
9. Demonstrate the steps involved in audio recording
10. Select, set up, operate audio equipment accessories such as auxiliary speakers, amplifiers, headsets
11. Record and edit audiotapes including simple narrations and narrations with music or sound effects
12. Perform normal maintenance and correct storage procedures for audio media such as splicing and cleaning of tapes or phonodiscs
13. Duplicate audiotapes for the following situations: stereo to stereo, stereo to monaural, monaural to monaural, reel to cassette, cassette to reel, and mass duplication
14. Given a tape recorder, record from phonodiscs, radio, audiotape, videotape
15. Select and specify audio recording or reproduction equipment for specific applications
16. Operate basic audio distribution and public address equipment

B. Units of instruction
1. Sound and audio frequencies
   a. Human hearing
   b. Loudness and pitch
   c. Factors determining sound reproduction quality
2. Microphones and application

a. Crystal microphones
b. Dynamic microphones
c. Velocity microphones
d. Classification by pickup direction

3. Audio amplifiers
   a. Review of fundamental principles of amplifiers
   b. Types, characteristics, applications, and limitations of audio amplifiers
4. Speakers
   a. Types, characteristics, and limitations of speakers
5. Recording and playback
   a. Disc recording
   b. Film recording
      (1) Optical
      (2) Magnetic
   c. Tape recording
6. Audio systems
   a. Types of audio systems
   b. Uses of audio systems
7. Phonographs and record or transcription players
   a. Major components of phonographs or transcription players
      (1) Monophonic and stereophonic systems
         (a) Turntables
         (b) Turntable drives
         (c) Tone arms
         (d) Cartridges or pickups
         (e) Needles or stylus
         (f) Amplifiers
         (g) Speakers and speaker systems
      (2) Recording speeds
   b. Factors to consider in selection and options
      (1) Multiple speeds
      (2) Record size and tone arm lengths
      (3) Speed control
      (4) Drive motors
      (5) Cartridges or pickups
      (6) Power output
         (a) Amplifier
         (b) Speakers
      (7) Controls
      (8) Auxiliary or accessories
   c. Maintenance and operation of phonographs and transcription players
      (1) Setup and operation
      (2) Changing needles, cartridges
      (3) Drive mechanisms
      (4) Care, handling, and storage of phonodiscs
      (5) Preventative maintenance
8. Tape recorders and playback equipment
   a. Principles of recording
      (1) Recording facilities
      (2) Recording procedures
   b. Types of each primary component
   c. Comparison of reel to reel, cartridge, and cassette
   d. Characteristics of tapes
      (1) Tape speeds
      (2) Types of tracks
      (3) Interchangeability
      (4) Editing and splicing problems
      (5) Duplication of audiotapes
   e. Problems of recording
   f. Factors in selection and specification of recorders and playback units
      (1) Uses
      (2) Power input vs. output
      (3) Specifications of reproduction quality
      (4) Options or accessories
   g. Use, operation, and maintenance of tape recorders
      (1) Preventative maintenance
      (2) Tape splicing, editing, cleaning
      (3) Care — handling — storage of tapes and equipment
   h. Audio distribution systems
   i. Specialized system

C. Laboratory

Laboratory exercises and performance evaluation involving:

1. Setup and operation of audio equipment
2. Diagnosis of malfunctions or problems with recorders and record players
3. Service and maintenance procedures and checklists for audio equipment
4. Specification and selection of equipment for practical problems
5. Recording techniques, including recording, editing, timing, audio mixing, sound synchronization, audio sources
6. Splicing and repair of tapes, cassettes, cartridges
7. Duplication of audiotapes

III. Principles of Projection

A. Performance objectives

Upon completion the student should be able to:

1. List and briefly describe the major components of projection systems
2. List and briefly describe the characteristics of common projection surfaces
3. Select and specify projection surfaces and projection equipment
4. Describe and demonstrate correct techniques of maintenance of projection equipment or surfaces
5. Compare the advantages and disadvantages of front and rear screen projection systems
6. List and describe the factors affecting image quality
7. List and describe the characteristics of projection lenses and relate the characteristics to the projection system and image quality
8. Given the dimensions, use, and physical description of a space, evaluate the projection system requirements and specify equipment needed
9. Given a description or visual example of common projection or image problems, determine the cause of the problem and recommend changes to correct the problem

B. Units of instruction
1. Projection system components
   a. Projectors
      (1) Optical systems
      (2) Lamps or light sources
   b. Lenses
      (1) Characteristics of lenses
      (2) Projection-lens relationships
      (3) Cost and specifications of lens
      (4) Cleaning and maintenance of lenses or optical systems
2. Front or rear projection
3. Screens and projection surfaces
   a. Types and characteristics
      (1) Front screen materials
      (2) Rear screen materials
      (3) Lens-screen relationships
   b. Screen size and audience relationships
   c. Screen and projection relationships
   d. Selection and specification of screens
      (1) Costs
      (2) Care, maintenance, and use
4. Projection system layout
   a. Screen location
   b. Image brightness
   c. Viewing angles and distances
   d. Projection booths
   e. Electrical requirements
   f. Environmental requirements
      (1) Lighting
      (2) Acoustics
      (3) Air conditioning
      (4) Seating
   g. Control systems
   h. Projection problems

C. Laboratory
1. Lecture demonstration of projection lens systems. Component adjustment and maintenance and projection problems
2. Student problem of layout of a rear screen projection system using front surface mirrors. Major considerations of projection relationships, adjustments, image sizes
3. Laboratory exercises in projection system layout including screen sizes, projection distances, image quality, projectors, environmental considerations
   a. Front projection
   b. Rear projection
4. Lecture demonstration and discussion of projection problems
5. Exercises in evaluating electrical requirements and control systems for projection systems

IV. Still Projection Equipment

A. Performance objectives

Upon completion the student should be able to:
1. Identify the major components and controls of common still projection equipment and describe the function of each
2. Set up and operate still projection equipment and audio-still projection systems
3. Perform normal service and maintenance of still projection equipment
4. Maintain and repair media for still projection equipment
5. List and briefly describe the factors to consider in selection of equipment for specific applications
6. Give a description of a space and user requirements, select the necessary still projection equipment and accessories

7. For common still projection equipment, describe the necessary service and maintenance procedures to maintain good operating condition
8. Given a list of still projection equipment, prepare a list of the necessary replacement parts and accessories inventory
9. Demonstrate the correct setup and use of still projection equipment to a specific audience

B. Units of instruction

1. Slide projectors and viewers
   a. Basic principles of construction and operation of slide projectors
      (1) Optical systems
      (2) Types of projectors
      (3) Advantages and limitations of each type
      (4) Options and accessories
   b. Factors to consider in selection and specification
      (1) Use
      (2) Projection areas or intended space
      (3) Lenses
      (4) Transparency size
      (5) Light output
      (6) Economics
   c. Operation and maintenance
      (1) Operational problems and normal maintenance
      (2) Care, storage, and handling of slides
2. Filmstrip projectors and viewers
   a. Construction and principal parts
      (1) Optical systems
      (2) Apertures (single and double frame)
      (3) Film feed system
   b. Options of projectors
      (1) Lenses
      (2) Sound systems
      (3) Special accessories
   c. Factors to consider in selection and specifications
   d. Operation and maintenance
      (1) Operating problems and normal maintenance
      (2) Care, storage, handling of filmstrips
3. Overhead projectors
   a. Construction and principal parts
      (1) Optical system
      (2) Stage
      (3) Projection head
      (4) Registration aids
   b. Options and accessories for overhead projectors
      (1) Acetate rolls
      (2) Motion or polarizers
      (3) Light output
   c. Factors to consider in selection and specification
   d. Maintenance
4. Opaque projectors
   a. Construction, principal parts
      (1) Optical system
      (2) Projection systems
      (3) Light output
      (4) Limitations
   b. Options of opaque projectors
   c. Factors of selection and specification
      (1) Projection
      (2) Economics
   d. Use, operation and maintenance

C. Laboratory

1. Laboratory exercises and performance demonstrations involving:
   a. Setup and operation of still projection equipment
   b. Maintenance, service, and repair of still projection equipment
   c. Splicing or repairing filmstrips, loading cartridges, trays, stacks
   d. Setup and operation of still projection equipment with auxiliary equipment such as audio synchronization, dissolve controls, polarizers, remote controls
   e. Use of audio pulse generator for audio synchronization of still projection media
2. Lecture demonstrations of projection problems, errors, and solution of projection difficulties
3. Exercises in the analysis and layout of projection systems including equipment selection, preparation of specifications, cost estimates and procurement materials
4. Exercises in the selection and specification of equipment for study carrel and audiovisual tutorial facilities

V. Motion Picture Projectors

A. Performance objectives

Upon completion the student should be able to:

1. For common motion projection equipment, identify the primary machine parts and controls and define the function of each
2. List and briefly describe the steps in setup and operation of motion picture projectors
3. List and briefly describe the normal maintenance procedures for motion projectors
4. Set up and operate motion projection equipment and auxiliary equipment
5. Perform common maintenance and service of motion projection equipment
6. Inspect, repair, clean, and properly store films
7. Diagnose and solve common service problems of motion projection and auxiliary equipment
8. List and briefly describe the major factors of consideration for selection of motion projection and auxiliary equipment
9. Evaluate the factors of selection and select and specify motion projection equipment and accessories for specific applications, spaces, or user requirements
10. Given a motion projection equipment inventory, prepare a list of parts, replacement items, and supplies for annual distribution, use and service of the equipment
11. Use the magnetic sound system of a projector to add sound to films by post-recording techniques including narration and narration with music or sound effects
12. Perform operation instruction demonstrations on setup and operation of motion projection equipment for specific audiences
13. Given the dimensions, physical description, and user requirements of a learning space, lay out a projection system, select appropriate equipment, and prepare the necessary materials

B. Units of instruction
1. Construction and principal parts of motion picture projectors
   a. Projection or optical systems
   b. Film feed systems
   c. Audio systems
   d. Silent and silent-sound projectors
   e. Optical sound systems
      (1) Components
      (2) Film speed and loops
   f. Magnetic sound systems
   g. Lenses and gates, pressure plates
   h. Power controls
2. Operating principles — 16 mm. projectors
   a. Threading
   b. Film travel
   c. Focus
   d. Framing
   e. Rewind and reverse
   f. Operating problems
   g. Options of 16 mm. projectors
      (1) Lenses
      (2) Illumination
      (3) Silent — sound — still
      (4) Auxiliary speakers
      (5) Accessory use of audio
      (6) Automatic threading
      (7) Power output
      (8) Reverse projection
   h. Super 8 and 8 mm. projectors
      (1) Cartridge projectors and viewers
      (2) Optical and magnetic sound systems
      (3) Sound on film
         (a) Projector compatibility
         (b) Sound mixing
   i. Factors in selection and specification
      (1) Use
      (2) Options
      (3) Economics
   j. Setup, operation, and maintenance of projectors
      (1) Cleaning
      (2) Checking audio systems
      (3) Replacement parts
      (4) Storage of equipment
      (5) Film care and maintenance

C. Laboratory
1. Laboratory instruction, exercises, and performance evaluation in:
   a. Setup and operation of 16 mm., 8 mm., and super 8 projectors
   b. Setup and operation of projector auxiliary equipment including speakers, public address systems, and remote control
   c. Film maintenance, cleaning, storage
   d. Use of magnetic sound systems of postaudio recording techniques
   e. Service, maintenance, repair,

storage, and distribution of projectors and accessories
f. Diagnosis and repair of common projector service problems including audio, optical, and mechanical components
2. Laboratory exercises in the layout of projection systems and selection of motion projection equipment for specific applications

VI. Equipment for Individualized and Programmed Instruction
A. Performance objectives
Upon completion the student should be able to:
1. List and briefly describe some of the equipment for programmed or individual instruction
2. List and briefly describe the advantages and disadvantages of retrieval systems
3. Describe briefly the capabilities and limitations of CAI and CMI instruction
4. List and briefly describe current trends in equipment or systems for individualized or programmed instruction
5. List and briefly describe several sources of information and media related to individualized or programmed instruction
B. Units of instruction
1. Teaching machines for programmed instruction
2. Language and learning laboratory equipment
3. Audio distribution systems
a. Tape transport systems
b. Dial or random access
4. Visual and video retrieval systems
5. Computer-managed and computer-assisted instruction
6. Study carrels or learning carrels
C. Laboratory
1. Lecture demonstrations or vendor demonstrations of new equipment
2. Field trip to area institution with individualized, programmed, or computer-related facilities
3. Simulated operator of audio, video distribution techniques

VII. Specifications of Spaces, Equipment, Supplies, and Materials
A. Performance objectives
Upon completion the student should be able to:
1. State the general considerations for instructional spaces utilizing media equipment
2. List and briefly describe factors of consideration or standards in regard to seating, projection, acoustics, illumination, power, and equipment operation
3. Given dimensions, physical description, user requirements of a learning space, new or existing, lay out, select equipment for the mediated system and recommend physical, utility, and environmental considerations
4. Prepare lists of necessary supplies, materials, and facilities for equipment distribution systems
5. Prepare checklists for routine or periodic maintenance, service, repair of media and equipment
6. Instruct in the operation, care, and storage of media equipment and media

B. Units of instruction
1. Factors of consideration
a. Use of space
b. Seating arrangements
c. Projection
d. Audio and acoustics
e. Illumination and lighting control
f. Present and future requirements
g. Sources of software
h. Utilization of equipment
i. Power and installation
j. Economics — available funds
k. Ventilation requirements
2. Sources of information, standards, equipment, and supplies

C. Laboratory
1. Specific problems in layout of spaces and selection of equipment for spaces
2. Preparation of supplies, lists of parts, replacements, material for operating budgets
3. Preparation of operating, service, maintenance schedules and checklists
4. Exercises in instructing in equipment operation, care, and material care and storage
5. Exercises in arrangement, setup, and operation of equipment in spaces to satisfy specific user requirements

Texts and References

Davidson. *Audio-Visual Machines.*

Eboch and Cochern. *Operating Audio-Visual Equipment.*

Isaacs and George. *Instructional Media — Selection and Utilization.*

Mannino. *ABC's of Audio-Visual Equipment and the School Projectionist's Manual.*

Oates. *Audio-Visual Equipment — Self Instruction Manual.*

Pula. *Application and Operation of Audio-Visual Equipment in Education.*

Wyman. *Mediaware — Selection, Operation and Maintenance.*

National Audio-Visual Association. *Audio-Visual Equipment Directory.*

Audio-Visual Trade Directory.

Educational Facilities Laboratories. *Instructional Hardware — A Guide to Architectural Requirements.*

Postlethwait. *The Audio-Tutorial Approach to Learning.*

Witherspoon and Kessler. *Instructional Television Facilities, A Planning Guide.*

Lewis. *Through Cable to Classroom — A Guide to ITV Distribution Systems.*

Related Media

McGraw-Hill Book Company, Textbook-Film Department, 330 W. 42d Street, New York, N.Y. 10036.

Audio-Visual Equipment Operation Series. 3-4 min., 8 mm., cart., color, 1965.

Summary: Series of film loops on operating selected types of media equipment. 27 film loops in series.

Chandler Publishing Co., 124 Spear Street, San Francisco, Calif. 94105.

Splicing Magnetic Tape. 2 min., 8 mm., cart., color, 1965.

Summary: Presents method of splicing magnetic tape without splicer.

Opaque Projector. 3 min., 8 mm., cart., color, 1965.

Summary: Illustrates the use of opaque projector.

International Film Bureau, 332 S. Michigan Avenue, Chicago, Ill. 60604.

Facts About Projection. 17 min., 16 mm., sd., color, 1963.

Summary: Discusses operational routines of showing 16 mm. films and 16 mm. film projection.

Facts About Films. 13 min., 16 mm., sd., color, 1963.

Summary: Presents film repair, maintenance, storage, and utilization.

Eastman Kodak Company, Visual Communications Programs, Audio-Visual Service 343 State Street, Rochester, N.Y. 14650.

Multimedia Classroom Facilities in Higher Education. 20 min., 35 mm., slides, sd. tape, color, 1970.

Summary: Various multimedia facilities in colleges are "toured" and discussed.

Designing for Projection. 80 min., 35 mm., Slide Program — 1970.

Summary: Clearly and completely discusses parameters and technical information of projection systems.

Effective Visual Presentations. 37 min., multimedia program.

Summary: Discusses and demonstrates effective visual presentations together with helpful techniques for planning, producing, presenting audiovisual programs.

Super 8 — A Unique Communication System. 30 min., multimedia program.

Summary: Discusses the advantages of Super 8 films and projectors as communication tools.

Basic Skill Films, 1355 Inverness Drive, Pasadena, Calif. 91103.

The Language Laboratory. 35 mm., filmstrip, 52 frames, color, sd., 1966.

Summary: Illustrates different language laboratory systems and their advantages.

National Audio-Visual Association, 1201 Spring Street, Fairfax, Va. 22030.

The Tape Recorder In Teaching. filmstrip, 52 frames, color, 1966.

Summary: Shows how tape recorder works.

A Room For Learning. 14 min., filmstrip, sd., color, 1968.

Summary: Describes the effective use of multimedia instruction rooms for efficient communication.

Dukane Corporation, Audio-Visual Division, St. Charles, Ill. 60174.

The Sound Filmstrip System. 35 mm., filmstrip, sd., color, 1966.

Summary: Demonstrates use of disc filmstrip equipment and materials.

University of Iowa Extension Division, Bureau of AV Instruction, Iowa City, Iowa 52240.

Principles of the 16 mm. Motion Picture Projector. 5 min., 16 mm., sd., b & w, 1960.

Summary: Shows features common to all 16 mm. sound projectors and the functions of these components.

Bailey Films, Inc., 6509 Delongpre Avenue, Hollywood, Calif. 90028.

How to Splice a Film. 35 mm., 38 frames, color, 1961.

Summary: Demonstrates handling of film and splicing.

Educational Media Incorporated, 809 Industrial Way, P.O. Box 39, Ellensburg, Wash. 98926

Television Utilization in Education.

Large Group Teaching Auditoriums.

Dial Access Information Retrieval Systems.

Computer Assisted Instruction.

Music Listening Systems.

Videotape Utilization Techniques.

Local Production Programs.

Language Laboratories.

35 mm., filmstrips, color, sd., reel or cassette tape.

Summary: A series of filmstrips presenting information and ideas for planning new facilities or programs utilizing media.

EDUCATIONAL TELEVISION TECHNIQUES

Hours Per Week
Class, 2; Laboratory, 6

Description

This course is designed as an introduction to open-circuit and closed-circuit television production techniques. The student learns the proper use of equipment commonly found in the studio, control room, and on a remote location. Basic materials, techniques, and terminology used in television are covered. Considerable time is spent training the students to plan and implement television productions. Students are expected to insert in their productions elements of graphics and design as well as photographic techniques learned in earlier courses within the curriculum.

Because of the nature of the course the laboratory sessions become most significant. During these times, students learn and practice the operation of equipment, as well as lighting techniques, microphone placement, and mechanical and electronic special effects. A requirement of the course is for each student to produce and direct a television sequence. The lecture and the laboratory content should be designed to enable the student to accomplish this objective.

No system of television production is complete unless there is an audience or group of students to receive the programs. In closed-circuit systems, buildings or homes are wired from a central distribution point. Or in some cases a point to point transmission system is utilized. The student in this course studies the various systems and deals with signal distribution in an individual classroom or study area.

Figure 6—Preparation of film and television studio sets together with the setup and operation of lighting, cameras and controls, enable the Educational Media Technician to assist in all aspects of television or film productions.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Open-Circuit and Closed-Circuit Television Systems	2	9
II. Television Production Materials	7	16
III. Studio and Remote Television Techniques	15	54
IV. Preparation of Instructional Television Techniques	5	12
V. Distribution of the Signal	3	5
Total	32	96

I. Open-Circuit and Closed-Circuit Television Systems
   A. Performance objectives
      Upon completion the student should be able to:
      1. Properly move the television camera including panning, tilting, dollying, and trucking
      2. Use the switcher fader and special-effects generator in order to get the most use from them
      3. Thread and operate the videotape recorder
      4. Properly use all the components of the television film chain including the slide projector and motion picture projector
      5. Demonstrate proper microphone placement and effective use of the audio control facilities
   B. Units of instruction
      1. Characteristics of open-circuit television
         a. UHF and VHF transmission
         b. Federal control
         c. Programming by networks
         d. Production and program costs
      2. Characteristics of closed-circuit television
         a. Cable television
         b. Instructional television fixed service
         c. Superiority of picture
         d. Production and program costs
      3. Utilization of television systems
         a. Commercial broadcasting

b. Educational broadcasting
c. Public broadcasting
d. Surveillance

C. Laboratory
1. Each student will practice camera movements including panning, tilting, dollying, and trucking
2. Practice using the switcher-fader and special effects generator
3. Practice threading and operating the videotape recorder
4. Practice using the film chain
a. Slide projector
b. 8 mm. film projector

II. Television Production Materials
A. Performance objectives
Upon completion the student should be able to:
1. Prepare a simple studio design before live television cameras
2. Properly light the studio for:
a. One person remaining stationary
b. Two people remaining stationary
c. One or more persons moving within three feet of their original location
d. An activity involving a great deal of studio space
3. Place microphone for:
a. Single-sound pickup
b. Multiple-sound pickup
4. Work in groups to prepare either:
a. Studio flat or
b. Mechanical special effect

B. Units of instruction
1. Studio
a. Design
b. Characteristics
c. Limitations
2. Studio lighting
a. Ceiling grid system
b. Lighting instruments
(1) Fresnel
(2) Scoops
(3) Internal reflectors
c. Planning for full lighting utilization
d. Lighting to depict
(1) Form
(2) Dimension
(3) Reality
(4) Nonreality
(5) Mood
(6) Contrast
e. Signal to noise ratio and lighting
f. Special lighting techniques
3. Audio
a. Microphones
(1) Types
(2) Characteristics
b. Microphone placement
c. Mixing sound (audio control board)
d. Recorded sound
e. Sound effects
f. The studio boom
g. Care in handling audio software
4. Properties for television
a. Building a flat
b. Advantages of drapes and cycloramas
c. Use of furniture in television
d. Arranging furniture for a television production
e. Using the floor as a property
f. Planning for space economy

C. Laboratory
1. Prepare a simple studio design before live television cameras
2. Properly light the studio for:
a. One person remaining stationary
b. Two people remaining stationary
c. One or more persons moving within three feet of their original location
d. An activity involving a great deal of studio space
3. Microphone placement for:
a. Single-sound pickup
b. Multiple-sound pickup
4. Working in groups the students will prepare either a:
a. Studio flat or
b. Mechanical special effect

III. Studio and Remote Television Techniques
A. Performance objectives
Upon completion the student should be able to:
1. Perform proper hand signals for television
2. Produce on tape a 10-minute remote production to be critiqued
3. Function in any studio or central room capacity including:
a. Cameraman
b. Floor manager
c. Boom operator
d. Director
e. Switcher
f. Videotape operator
g. Audio

h. Film chain
i. Lighting
j. Talent

B. Units of instruction
1. Studio and control room production personnel
2. Handsigned
3. Remote television equipment
a. Cameras
b. Videotape recorder
c. Audio
d. Switcher-fader
e. Special effects
4. Techniques of producing remote television productions
a. Planning for various locations
b. Unique lighting problems
c. Checklist of items to transport
5. Producing for television
a. Selecting content appropriate for television
b. Identification of media for content presentation
c. Securing of properties and graphics
d. Knowledge of crew positions and selection of personnel
e. Script preparation
f. Production schedules
6. Directing for television
a. Understanding of the script objectives
b. Ability to develop crew members into a workable team
c. Complete understanding of all television equipment
7. Writing for television
a. Script format and writing techniques
b. Storyboarding for television
c. Content objectives
d. Presentation format
e. Time allocation for main points
f. Planning for camera movements and lens changes
g. Planning for film and graphics
h. Planning for scenery and props
i. Planning audio

C. Laboratory
1. Practicing hand signals for television
2. Produce on tape a 10-minute remote production to be critiqued
3. Using an instructor-prepared script, each student will rotate to all crew positions:
a. Cameraman
b. Floor manager
c. Boom operator
d. Director
e. Switcher
f. Videotape operator
g. Audio
h. Film chain
i. Lighting
j. Talent
4. Each student is responsible for writing, producing, and directing a 10-minute videotape production using the class members in the crew positions

IV. Preparation of Instructional Television Materials

A. Performance objectives

Upon completion the student should be able to:
1. Prepare a set of photographs for use in a studio or remote production
2. Prepare at least one overhead transparency for use on television
3. Prepare a minimum of five slides for use in their studio videotape production
4. Prepare a 1-minute 8 mm. film for use during their studio videotape production
5. Prepare at least one super card
6. Prepare at least three studio cards for use in the remote videotape production

B. Units of instruction
1. Instructional materials for television
a. Graphics
b. Photographs
c. Transparencies
d. Slides
e. Motion pictures
f. Display
g. The super card
h. The studio card
2. Special considerations in preparing instructional materials for television
a. Aspect ratio of three units high by four units wide
b. Essential area, transmission or scanning area, blank border or marginal area
c. Materials to be simple, bold, and free from unnecessary detail
d. Minimum letter height and minimum number of words
e. The gray scale
3. Lettering
a. Hand lettering
b. Lettering guides

c. Rub-on letters
d. Printing
4. Techniques for using the studio card
a. Flipping card
b. Pulling card
c. Drop-in or drop-out method
d. The studio crawl

C. Laboratory
1. Each student will prepare a set of photographs for use in a studio or remote production
2. Each student will prepare at least one overhead transparency for use on television
3. Each student will prepare a minimum of five slides for use in a studio videotape production
4. Each student will prepare a 1-minute 8 mm. film for use during the studio videotape production
5. Each student will prepare at least one super card
6. Each student will prepare at least three studio cards for use in the remote videotape production

V. Distribution of the signal

A. Performance objectives

Upon completion the student should be able to:

1. Define over the air transmission of a television signal using VHF and UHF
2. Define microwave transmission of a television signal
3. Describe the 2500 Megahertz Instructional Television Fixed Service and indicate its application
4. Describe the master antenna television system used in instruction and indicate its application
5. Describe the transmission by an instructional television system using coaxial cable and indicate its application

B. Units of instruction
1. Characteristics and differences of VHF and UHF television transmission
2. Using microwave to transmit a television signal
3. The 2500 Megahertz Instructional Television Fixed Service system
4. The master antenna television system
5. Using coaxial cable to send a television system

C. Laboratory
1. Prepare a listing of the VHF and UHF transmitting stations familiar and study their power output compared to the areas they serve
2. Roughly plan a 2500 MH_z television system for a community of the students choice
3. Using a campus building not wired for MATV the student will plan the location of the antenna and the position of the terminals for each instructional space

Texts and References

Diamond. *A Guide To Instructional Television.*
Gordon. *Classroom Television: New Frontiers in ITV.*
Moffatt. *Hot Lights and Cameras: Basic Techniques For Educational Television.*
Murphy and Gross. *Learning by Television.*
Wilkie. *The Technique of Special Effects in Television.*
Witherspoon and Kessler. *Instructional Television Facilities.*
Zettl. *Television Production Handbook.*

Related Media

Great Plains National Instructional Television Library

The CETO Television Training Films. color, sd.
Summary: The series contains 24 presentations in instruction in television production procedures.

The Fourth Network. 16 mm., color, sd.
Summary: This film explores both current practices in ETV and its potential for the future.

The Studio Teacher. 1/2 in., 1 in., b & w.
Summary: This video tape identified an instructional lesson and explains the equipment and operations employed there.

Ampex Corporation

Television Training Tapes. 1/2 in., b & w.
Summary: A series of 30 videotape productions designed to train personnel in the many areas of television production.

TECHNICAL ILLUSTRATION

Hours Per Week
Class, 16; Laboratory, 96

Description

Technical illustration is the designing and preparing of visual materials in pictorial form for use with advertising and in instructions for assembling, installing, operating, maintaining, or repairing industrial products.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Introduction to Technical Illustration	2	0
II. Isometric Drawing	2	15
III. Perspective Drawing	2	20
IV. Dimetric System of Pictorial Drawing	4	20
V. Simplified Rotation of Views	2	10
VI. Shading of Drawings	2	16
VII. Preparing Technical Illustrations for Reproduction	2	15
Total	16	96

I. Introduction to Technical Illustration
- A. Performance objectives
  Upon completion the student should be able to:
  1. Describe the field of technical illustration
  2. List the qualifications of a technical illustrator
  3. Define the use of all the equipment used by technical illustrators
- B. Units of instruction
  1. Review of basic drafting techniques
  2. The field of technical illustration
  3. Functions or duties of a technical illustrator
  4. Qualifications of a technical illustrator
  5. Equipment used by a technical illustrator
- C. Laboratory
  None

II. Isometric Drawing
- A. Performance objectives
  Upon completion the student should be able to:
  1. Describe the theory of isometric drawing
  2. Construct pictorial drawing using the isometric system
- B. Units of instruction
  1. The isometric cube
  2. Measuring in isometric
  3. Reference lines and points
  4. Line and plane positions in isometric
- C. Laboratory
  1. Laboratory exercises in the construction of isometric drawings for use as technical illustrations, including exploded isometric drawing

III. Perspective Drawing
- A. Performance objectives
  Upon completion the student should be able to:
  1. Describe the theory of perspective drawing
  2. Use perspective theory to construct pictorial drawings
- B. Units of instruction
  1. Theory of perspective
  2. Constructing a circle in perspective
  3. Perspective ellipse templates
- C. Laboratory
  1. Laboratory exercises working with the theory of both parallel and angular perspective and production of drawings that can be used in the instructional field

IV. Dimetric System of Pictorial Drawing
- A. Performance objectives
  Upon completion the student should be able to:
  1. Describe the dimetric system of drawing
  2. Construct drawing using the dimetric system of drawing
- B. Units of instruction
  1. Description of diametric system
  2. Preferred diametric projection used in basic views
  3. Taking dimetric measurements
  4. Using foreshortened scales
  5. Selecting the proper view
  6. Finding the degree of ellipse to be used
- C. Laboratory
  1. Laboratory exercises in production of pictorial drawing using the fundamentals of the dimetric system

V. Simplified Rotation of Views
   A. Performance objectives
      Upon completion the student should be able to:
      1. Describe rotation of views
      2. Use the theory to produce pictorial drawings
   B. Units of instruction
      1. Plotting simple angle
      2. Plotting compound angle
      3. Rotation of view
      4. Trimetric drawing
   C. Laboratory
      1. Projects in simple rotation of views are assigned to produce pictorial drawings which require the plotting of simple and compound angles

VI. Shading of Drawings
   A. Performance objectives
      Upon completion the student should be able to:
      1. List and describe the various types of shading
      2. Locate the direction of lighting
      3. Shade drawings using any type listed
   B. Units of instruction
      1. Location of shaded areas
      2. Solid line shading
      3. Shading films
      4. Wash
      5. Airbrush
   C. Laboratory
      1. Laboratory projects are assigned requiring the student to utilize a number of techniques, including line and pen shading, shading films, airbrush and wash techniques, to enhance the pictorial quality of drawings

VII. Preparing Technical Illustrations for Reproduction
   A. Performance objectives
      Upon completion the student should be able to:
      1. List and describe different types of reproduction of technical drawing
      2. Mount drawing to be reproduced
      3. Make necessary changes in drawing depending on method of reproduction to be used
   B. Units of instruction
      1. Mounting and flapping
      2. Pasting-up illustrations
      3. Proportioning illustrations
      4. Photocopy methods
      5. The gray scale
      6. Reproductive processes
   C. Laboratory
      1. Laboratory assignments will require the pictorial drawing to be prepared for reproduction taking into account the limitations of various methods of reproduction

Texts and References

Gibby. *Technical Illustration.*

Related Media

McGraw-Hill Company, Visual Education Department, New York, N.Y.
Introducing Graphs. 16 mm. film, color.
Mechanical Drawing Transparency Series.
Bailey Films Incorporated
Design. 16 mm., color film.
LaPine Scientific Company, Irvington, N.Y. 10533.
Transparent Model for Drafting — Illustrating.
Broadhead Garrett Company, Cleveland, Ohio 44105.
Drafting Teaching Aids DTP-1. models.
Science Research Associates, Inc., 259 E. Erie Street, Chicago, Ill. 60611.
Perspective Drawing Series.

REPROGRAPHICS

Hours Per Week
Class, 2; Laboratory, 6

Description

A course designed to familiarize the student with various duplicating methods, techniques, and equipment with primary emphasis on developing basic skills in offset duplication.

The student will learn operational procedures for various makes and types of office copiers, fluid and stencil duplicators, and small offset presses. Self-instruction units in the office copier and fluid and stencil duplication area will leave most of the laboratory time free for offset duplication instruction.

Areas of study include copy preparation, stencil and master preparation for office duplicators, camera work, stripping, platemaking, press work, and bindery operations in the offset duplicating field. Related areas of study include papers, ink, history of printing, and printing production.

An integral part of the course is application of the principles of design and graphics, technical illustration and photography, to the preparation of press-ready copy. A review of basic design principles is provided to facilitate requirement of quality design practice in each printing project.

Figure 7—Educational Media Technicians should be capable of operating duplicating equipment and offset printing.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Orientation	2	1
II. History of Printing	2	0
III. Printing Production	2	0
IV. Office Duplicating Methods	4	11
V. Copy Preparation (Review)	2	12
VI. Photo Conversion	6	16
VII. Image Carrier Preparation	4	16
VIII. Paper and Ink	2	4
IX. Image Transfer	6	24
X. Finishing Procedures	2	12
Total	32	96

I. Orientation
- A. Performance Objectives
  - None
- B. Units of instruction
  1. Course organization
     - a. Textbook
     - b. Assignments and projects
     - c. General course procedures
     - d. Grading policy
  2. Laboratory facility
     - a. Utilization
     - b. General laboratory procedures
     - c. Maintenance
  3. Equipment and materials
     - a. Equipment utilization
     - b. Equipment maintenance
     - c. Material sources
     - d. Material waste
  4. Laboratory safety
     - a. Importance of safety
     - b. Carelessness and safety
     - c. Accident prevention
     - d. Developing proper, safe work habits
- C. Laboratory
  1. Tour laboratory facility
  2. Brief explanation of each piece of equipment and its use

II. History of Printing
- A. Performance objectives

  Upon completion the student should be able to:
  1. Describe in outline form the development of modern printing techniques from early forms of visual communications
  2. Identify and describe in terms of theory and application various printing methods including:
     - a. Letterpress
     - b. Silk screen
     - c. Gravure
     - d. Intaglio
     - e. Offset

B. Units of instruction
1. Background
a. Early forms of visual communications
b. Development of written communications
c. Early reproduction methods
d. Development of modern printing
2. Letterpress printing
a. Theory of letterpress printing
b. Uses
3. Silk screen
a. Theory of silk screen printing
b. Uses
4. Gravure and intaglio
a. Theory
b. Uses
5. Offset printing
a. Theory
b. Uses
c. Growth and development of offset duplication

C. Laboratory
None

III. Printing Production
A. Performance objectives
Upon completion the student should be able to:
1. Identify and describe in outline form the route of printing production flow in terms of:
a. Conventional printing operations
b. Production organization
2. List and define specific job areas and related job areas available upon successful completion of this course

B. Units of instruction
1. Production flow
a. Job planning and layout
b. Copy preparation
c. Camera
d. Stripping
e. Platemaking
f. Presswork
g. Finishing operations
2. Production organization
a. Personnel
b. Procedures
3. Employment areas
a. Commercial
b. In-house education and industry
4. Related employment areas
a. Equipment and material production
b. Equipment and material sales
c. Art
d. Photography

C. Laboratory
None

IV. Office Duplicating Methods
A. Performance objectives
Upon completion the student should be able to:
1. Explain the operation and theory of all copying and duplicating processes including:
a. Dye transfer
b. Electrostatic
c. Xerography
d. Thermal
e. Diffusion transfer
f. Spirit
g. Stencil
h. Offset
by diagramming, labeling, and outline each
2. Operate all available copiers and duplicators, and produce good copies by practical application and evaluation through structured laboratory projects
3. Select and justify in terms of number of copies, quality, ease of operation, cost, type of master preparation, the best process to utilize in completing any given copying or duplicating case problem

B. Units of instruction
1. Introduction
a. Utilization of office copiers and duplicators
b. Types
2. Operation and theory of office copiers
a. Dye transfer
b. Electrostatic
c. Thermal
d. Diffusion transfer
3. Spirit duplication
a. Theory of process
b. Operational procedures
c. Typing a master
d. Thermal masters
4. Stencil duplication
a. Theory of process
b. Operational procedures
c. Typing a stencil
d. Types of stencils
5. Offset duplication
a. Theory of process

b. Types of offset duplicators
c. Preparing direct-image masters
d. Preparing electrostatic masters
e. Typing copy for offset duplication

6. Process selection
a. Number of copies needed
b. Quality desired
c. Ease of operation
d. Cost
e. Preparation of master copy

C. Laboratory

1. Prepare masters for all methods available including spirit master, stencil, direct-image master, electrostatic master
2. Make copies from available equipment including various office copiers, spirit, stencil, and offset duplicators
3. Given any office copying or duplicating problem, select an appropriate process and justify it in terms of quantity, quality, cost, and ease of preparation

V. Copy Preparation (Review)

A. Performance objectives

Upon completion the student should be able to:

1. Prepare camera-ready art utilizing the principles of good design and composition, demonstrating high standards in neatness and organization by successful completion of structured laboratory projects

B. Units of instruction

1. Design
a. Proportion
b. Balance
c. Contrast
d. Rhythm
e. Harmony

2. Layout
a. Thumbnail sketches
b. Rough layout
c. Comprehensive layout
d. Final layout — camera-ready art

3. Composition
a. Copyfitting
b. Type selection
c. Type structure

4. Mechanical
a. Pasteup
b. Overlays
c. Accuracy and cleanliness

C. Laboratory

1. Prepare a series of thumbnail sketches
2. Make rough layout from thumbnail sketches
3. Make comprehensive layout from rough layout
4. Prepare a pasteup for line photo conversion
5. Prepare a pasteup for halftone photo conversion
6. Prepare an overlay pasteup

VI. Photo Conversion

A. Performance objectives

Upon completion the student should be able to:

1. Function in a graphic arts darkroom by demonstrating the ability to:
a. Properly mix chemicals
b. Operate a process camera
c. Expose and process film by standard procedures including line and halftone negatives through successful completion of structured laboratory projects

B. Units of instruction

1. Process camera
a. Orientation
b. Types
c. Operation

2. Darkroom procedures
a. Layout and design
b. Chemistry
c. Materials
d. Procedures

3. Line photography
a. Theory
b. Procedures

4. Halftone photography
a. Theory
b. Halftone screen
c. Procedures

5. Specialized materials
a. Autoscreen film
b. Stabilization film and paper

6. Specialized procedures
a. Still development
b. Other

C. Laboratory

1. Expose and process a line negative from prepared pasteup
2. Expose and process a halftone negative from prepared pasteup
3. Expose and prepare multiple negatives from prepared overlay pasteup

VII. Image Carrier Preparation

A. Performance objectives

Upon completion the student should be able to:

1. Demonstrate conventional procedures for negative opaqueing, stripping, and exposing and processing presensitized offset plates through successful completion of structured laboratory projects

B. Units of instruction

1. Stripping
   a. Tools, materials, and equipment
   b. Procedures
   c. Special techniques
2. Platemaking
   a. Materials and equipment
   b. Chemistry
   c. Procedures
   d. Special materials
   e. Special techniques

C. Laboratory

1. Prepare a flat including a line negative
2. Expose and process a presensitized plate
3. Prepare a flat including a halftone negative
4. Prepare plates from multiple negatives
5. Utilize a screen tint in preparing a presensitized plate

VIII. Paper and Ink

A. Performance objectives

Upon completion the student should be able to:

1. Briefly describe in outline form the history, manufacturing processes, and physical characteristics of papers and inks
2. Choose, figure, cut stock
3. Demonstrate the ability to utilize, mix, and match inks

B. Units of instruction

1. Papermaking
   a. Brief history of paper
   b. Paper manufacturing
2. Types, sizes, and weights
   a. Finishes
   b. Grain
   c. Wire side
   d. Felt side
   e. Basic sizes
   f. Weights
   g. Watermarks
3. Figuring stock
   a. Paper selection
   b. Cutting diagrams
   c. Calculating cuts
   d. Papercutter
4. Ink characteristics
   a. Ink manufacturing
   b. Chemistry
5. Ink mixing and matching
   a. Use of color
   b. Mixing color
   c. Ink additives
   d. Special-purpose inks

C. Laboratory

1. Have students run a project utilizing transparent and opaque inks on various colors of stock and evaluate for color changes of ink
2. Have students choose appropriate stock for a project
3. Cut stock to size
4. Choose appropriate color ink or mix appropriate color
5. Print project using stock and ink chosen

IX. Image Transfer

A. Performance objective

Upon completion the student should be able to:

1. Set up, operate, clean up, and maintain all available offset presses in preparing printed materials through successful completion of structured laboratory projects

B. Units of instruction

1. Press orientation
   a. Theory
   b. Types
   c. Sizes
2. Press functions and controls
   a. Operating controls
   b. Dampening system
   c. Inking system
   d. Cylinders
   e. Feed system
   f. Delivery system
3. Press setup
   a. Feeder unit
   b. Register and positioning
   c. Printing unit
   d. Delivery unit
4. Press operation
   a. Sequence of procedures
   b. Running
   c. Troubleshooting
   d. Safety

5. Press cleanup
   a. Procedures
   b. Results of poor cleanup
6. Press maintenance
   a. Daily
   b. Periodical
   c. Company Service

C. Laboratory
1. Prepare and utilize offset equipment for image transfer
2. Maintain acceptable image quality for several hundred copies
3. Lubricate equipment at proper time

X. Finishing Procedure

A. Performance objectives

Upon completion the student should be able to:

1. Perform basic finishing procedures including:
   a. Cutting
   b. Trimming
   c. Folding
   d. Stitching
   e. Binding
   f. Padding
   g. Punching
   h. Drilling

   finished printed materials by all methods available through successful completion of structured laboratory projects

B. Units of instruction
1. Papercutting and trimming
2. Collations
   a. Hand
   b. Machine
3. Stitching
   a. Procedures
   b. Side stitching
   c. Saddle stitching
4. Mechanical binding
   a. Equipment and materials
   b. Procedures
5. Padding
   a. Equipment and materials
   b. Procedures
6. Punching, drilling
   a. Equipment
   b. Procedures

C. Laboratory
1. Fold, assemble, or prepare materials for finishing
2. Bind or fasten materials in available methods, including stitching, mechanical, padding, punching and drilling

Texts and References

A.B. Dick Company. *Graphic Communication Series.*
——. *Communicating with Graphics.*
——. *Artwork.*
——. *Image Assembly.*
——. *Photo Conversion.*
——. *Image Carrier Preparation.*
——. *Image Transfer.*
——. *Finishing Procedures.*
——. *Decision Making.*
——. *Teacher's Manual/Transparency Masters.*
——. *Fundamentals of Offset.*
——. *Techniques of Offset.*
——. *Fundamentals of Mimeographing.*
——. *Techniques of Mimeographing.*

Related Media

A.B. Dick Company, 5700 W. Touhy Avenue, Chicago, Illinois 60648.
Techniques of Modern Offset. filmstrips with sd., 33 RPM records, 8 filmstrips.
The Paper Master.
Artwork — Your Blueprint to Printing.
Preparing Presensitized Metal Plates.
Offset Inks and Printing Papers.
Operating a Table-Top Offset.
Operating a Floor-Model Offset.
Tips for the Offset Operator.
Offset and You.
Techniques of Modern Fluid Duplicating. 2 filmstrips, sd., 33 RPM records.
Techniques of Modern Mimeographing. 2 filmstrips, sd., 33 RPM records.

Eastman Kodak Company, Audio Visual Services, Rochester, N.Y.
Line Photography. 35 mm., slides, sd., narrated tape, script.
Summary: Discusses general procedures for preparing copy for line photography.
Halftones and Other Tones. 35 mm., slides, sd., narrated tape, script.
Summary: Provides an introduction to photomechanical reproduction.

MEDIA PRODUCTION

Hours Per Week
Class, 32; Laboratory, 96

Description

This course is structured experience dealing with all aspects of planning and production for the solution of instructional problems. Basic materials, techniques, and skills are applied to solutions of specific problems. Specific group projects will involve planning, organization, estimating, scheduling, and final production of media. Previous courses attend primarily to development of techniques and skills. A needed aspect of technician training is to consider the complete problem of production and application of techniques to solution of problems. This course assumes completion of formal instruction in photography, design, filmmaking, reprographics, television, and management, together with an understanding of production equipment, materials, supplies, and production economics.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Analysis of Instructional Problems	6	6
II. Interpretation of Appropriate Media, Methods, and Materials	5	9
III. Translation of Subject to Media or Materials	4	6
IV. Production Planning	9	9
V. Production	0	48
VI. Critique, Review, Evaluation, Revision	4	6
VII. Technique, Processes, and Equipment	4	12
Total	32	96

I. Analysis of Instructional Problems
- A. Performance objectives
  Upon completion the student should be able to:
  1. State and briefly describe the necessary steps in analyzing an instructional problem in regard to media production
  2. Describe the interrelationships of the instructional media staff subject matter specialist and media specialist
  3. List the steps and considerations involved in evaluating a project and establishing realistic objectives, schedules, and budgets
- B. Units of instruction
  1. The systems approach
  2. Behavioral objectives
  3. Skill analysis
  4. Measuring instruments
  5. Selection of instructional procedures (introduction)
  6. Relation of media, materials to instructional problem analysis
- C. Laboratory
  1. An approach to planning a specific instructional project. Developing objectives of project, creating plans to adapt project to media, use of subject matter specialist
  2. Evaluating need for media in solution of problem
  3. Discussion of case studies related to above concepts

II. Interpretation of Appropriate Media, Methods, and Materials
- A. Performance objectives
  Upon completion the student should be able to:
  1. List and briefly describe the considerations in deciding upon the most appropriate media or format of a specific problem
  2. Describe the characteristics and relative merits of each media or format
  3. Demonstrate a knowledge of production economics, labor, and facilities related to each media or format
- B. Units of instruction
  1. Discussion of media for materials
     a. Slides — filmstrips
     b. Overheads
     c. Film
     d. Television
     e. Audio
     f. Printed copy
  2. Evaluation of effectiveness by comparative examples
- C. Laboratory
  1. Comparison of media formats
     a. Analysis of presentation by different media

b. Comparison of effectiveness and merits of media
2. Analysis of use of materials
a. Instruction or training
b. Independent or tutorial
c. Supportive aids, materials

III. Translation of Subject to Media or Materials
A. Performance objectives
Upon completion the student should be able to:
1. Analyze the requirements of composition of the material
2. Describe the specific characteristics of the subject area such as format, symbols, terminology, and composition
3. Define the relationship of the media technician and subject matter specialist
4. Describe the general procedures for research and reference of a topical area
B. Units of instruction
1. Maintaining realism
2. Visualizing
3. Symbols — terminology
4. Media technician and subject matter specialist
5. Case study or evaluation
C. Laboratory
1. Preliminary planning
a. Development of objective
b. Need for subject matter specialist
c. Selection of format
2. Requirements of presentation
a. Symbols — terminology
b. Realism or animation
c. Color, composition
3. Case study evaluation of techniques by comparison

IV. Production Planning
A. Performance objectives
Upon completion the student should be able to:
1. List and briefly describe the steps in planning the production of media for a specific project
2. Describe the work flow pattern of the production processes
3. Prepare estimates of time, labor, facilities, and material necessary to schedule a production
4. Prepare a time, manpower, material estimate and production schedule for media productions
B. Units of instruction
1. Scripts — outlines
2. Storyboarding
3. Estimating materials
4. Material selection
5. Scheduling or real time estimating
6. Facilities and equipment
C. Laboratory
1. Introductory preparation of script or outline for a filmstrip. The laboratory project requires a great amount of instructional supervision. This preparation of script and outline must be done under the direct supervision of the subject matter specialist. If the project is related to the field of physics the student must work closely with a physics instructor
2. Storyboarding
3. Estimating material requirements
4. Equipment requirement analysis
5. Scheduling or real time estimating
a. Script and storyboard
b. Graphics and design
c. Ordering and process times
d. Photography and processing
e. Review — editing
f. Audio synchronization
g. Layout, stripping plate preparation
h. Printing, binding
i. Presentation and review

V. Production
A. Performance objectives
Upon completion the student should be able to:
1. Develop the preliminary materials necessary for specific project production in cooperation with media and subject matter specialist
2. Develop a production schedule and cost analysis for specific project production
3. Produce the necessary media or materials for completion of a specific multimedia project
B. Units of instruction
C. Laboratory
1. Scheduling of assignments or roles in production
2. Script — storyboarding
3. Graphics and design
4. Photography — processing
5. Review and editing
6. Audio synchronization
7. Copy preparation

8. Printing — binding
9. Presentation and review
10. Cost comparison and production hours vs. estimates

VI. Critique, Review, Evaluation, Revision
A. Performance objectives
Upon completion the student should be able to:
1. List the principal factors for consideration in review or evaluation of materials
2. Critically evaluate materials in regard to appropriateness, quality, and objectives
3. Discuss alternative procedures or formats of production
B. Units of instruction
1. Principles of critiquing and evaluation
C. Laboratory
1. Project review
a. Evaluation of alternative procedures
b. Effectiveness of materials and format

VII. Techniques, Processes, and Equipment
A. Performance objectives
Upon completion the student should be able to:
1. List and briefly describe new production techniques or processes
2. Discuss the current trends in utilization of media or equipment
B. Units of instruction
1. New equipment systems
2. Methods, techniques
C. Laboratory
1. Lecture demonstration of new media, procedures, and equipment by vendors

Texts and References

Minor and Frye. *Techniques for Producing Visual Instruction.*
Kemp. *Planning and Producing Audiovisual Materials.*
Banathy. *Instructional Systems.*
Frank Holmes Laboratories, Inc. *Facts You Should Know About Filmstrips.*
National Audio-Visual Association, Inc. *Audio-Visual Equipment Directory.*
Eastman Kodak Company. *Kodak Publications and Pamphlets.*

Related Media

Encyclopedia Britannica Educational Corporation, 425 N. Michigan Avenue, Chicago, Illinois 60611.
The Unique Contribution. 30 min., 16 mm., sd., color, 1959.
Summary: Discusses value of films as a teaching tool and demonstrates their use.

DuArt Film Labs, Inc., U.S. Government Film Service, 245 W. 55th Street, New York, N.Y. 10019
Instructional Television at Pennsylvania State University. 60 min., 16 mm., sd., b & w, 1966.
Summary: A film case study report of the experiences of successful use of campus-wide closed-circuit television.

Eastman Kodak Company, Advertising Distribution, Department 454, Rochester, N.Y. 14650.
Effective Visual Presentations. 37 min., multimedia program.
Summary: Demonstrates effective visual presentations and a number of helpful techniques for planning, producing, presenting programs.
Movies Move People. 26 min., 16 mm., sd., color.
Summary: Demonstrates how movies can be used to solve communication problems.
Super 8 — A Unique Communication System. 30 min., multimedia program.
Summary: Demonstrates use, flexibility, and application of Super 8 films and projectors in business, industry, and education.

3M Company
New Concepts in Creative Teaching with the Overhead Projector. 14 min., 16 mm., sd., color, 1963.
Summary: Application of overhead projector in classroom with emphasis upon effecting teaching.

MANAGEMENT OF MEDIA AND RESOURCES

Hours Per Week
Class, 48; Laboratory, 32

Description

The purpose of this course is to develop an appreciation for the organization and effective management of instructional resource centers. Relationships of the educational media technician to media directors and specialists and the functions and responsibilities in an educational or industrial media department are explored. Business procedures of ordering, estimating, scheduling, inventorying, budgeting, and accounting and operational procedures of evaluation, procurement, distribution, control, and maintenance are presented. Attention is given to management of facilities, production, production planning, distribution and storage of media and equipment in regard to both new or existing departments and various organizations of departments.

Background from previous courses such as Media Equipment Operation and Maintenance or Media Productions is extensively applied throughout the course to facilitate development of techniques of management of media and resources. Laboratory time is used to simulate the organization, operation, development of procedures and controls and management of an instructional resource center. An introduction to the types, organization, and responsibilities of libraries together with brief experience in library operation is presented to develop areas of common services.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Media Departments	3	2
II. Organizational Patterns of Departments	2	0
III. Library Resources and Services	6	4
IV. Administering Media and Equipment	12	8
V. Implementing and Administering Media Preparation Services	10	8
VI. The Physical Environment and Equipment for Media Utilization	9	6
VII. Budgeting for Media Services	6	4
Total	48	32

I. Media Departments
- A. Performance objectives
  Upon completion the student should be able to:
  1. State the general purposes of media departments or centers
  2. List the staff of a full or partial service department and indicate the responsibilities or performed functions together with qualifications of each
  3. List and describe briefly the common services of a media department
  4. List the types of media, materials, and equipment normally encountered together with the services, problems, and special requirements of each
  5. Describe various media department work tasks and distinguish those which are clerical, paraprofessional, and professional
- B. Units of instruction
  1. Purposes of media department or center
     a. Provide support services of production and reproduction of instructional materials
     b. Provide library services of acquisition, organization, effective distribution of media, materials, and equipment
     c. Provide assistance in developing, implementing instructional materials
  2. Staff of media departments
     a. Media director
     b. Media specialists
     c. Media technicians
     d. Media aides
     e. Clerical, secretarial
  3. Functions and services of media departments
     a. Production and reproduction
        (1) Graphics
        (2) Photography
        (3) Film production
        (4) Printing and duplicating
        (5) Television services

(6) Displays
(7) Audio services

b. Acquisitions
(1) Research — references
(2) Promotion
(3) Evaluation of media, materials
(4) Evaluation of equipment
(5) Scheduling, booking
(6) Bibliographic organization
(7) Purchase and rentals

c. Distribution
(1) Media and equipment distribution and control
(2) Equipment repair and maintenance
(3) Media maintenance or repair
(4) Operational instructions
(5) Equipment operation

d. Management, research, development functions
(1) In-service programs
(2) Instructional materials and development
(3) Budgeting for media services
(4) Service to community

4. Types of media and equipment
a. Films, filmstrips, slides
b. Transparencies
c. Videotapes
d. Audiotapes and phonodiscs
e. Graphics
f. Photographs and flat pictures
g. Charts, displays, booklets, exhibits, models, realia
h. Programmed materials and equipment
i. Projection equipment
j. Audio and video equipment
k. Production equipment and supplies
l. Computer related or assisted materials

C. Laboratory
1. Prepare lists of services and necessary staff, skills, facilities for a typical instructional media center. Relate lists to curriculum and media technician's background
2. Field trip to local media center or guest speakers from educational and industrial training center

II. Organizational Patterns of Media Departments

A. Performance objectives

Upon completion the student should be able to:

1. Describe and list the functional services of centralized and departmental media centers
2. Discuss in writing the advantages and disadvantages of centralized and departmental media centers
3. Describe the typical media service organization and particular problems associated with media services in single schools, district or county systems, university or college systems, industrial training or agency-institutional systems
4. List the probable staff and faculty requirements for various systems
5. List or identify the probable control considerations associated with various media service systems

B. Units of instruction
1. Centralized, library-directed resource centers
2. Departmentalized or decentralized centers
3. Types of organizations
a. Single school
b. District or county systems
c. University or college
d. Industrial training
e. Agency or institutional

C. Laboratory
None

III. Library Resources and Services

A. Performance objectives

Upon completion the student should be able to:

1. List and briefly describe the general purposes of libraries
2. Describe briefly the common functions and services of a library
3. List and briefly describe the various kinds of materials libraries house and disseminate
4. Describe the organizational structure of various types of libraries including school, public, academic, special libraries
5. List and briefly describe the functional areas common to most libraries
6. List and briefly describe the various library work tasks
7. Describe briefly the specific functions or services of various types of libraries including school, public, special, and

academic libraries
8. List and briefly describe the role of the media production center in relation to libraries
9. Describe and compare the media services provided by a school library, academic library, public library, and special library
10. Describe the general organization and procedures of library acquisition centers
11. Perform routine maintenance procedures and display preparation for a library
12. Describe the principal methods of organizing and cataloging library materials
13. List the reader services which may be expected in various types of libraries
14. Use the principal reference tools to locate materials for topical assignments or to assist others in effectively using the library

B. Units of instruction
1. General purposes of libraries
2. Library materials
   a. Books
   b. Periodicals
   c. Microforms
   d. Graphics
   e. Vertical file
   f. Media
   g. Equipment and facilities
3. Library personnel
   a. Clerical
   b. Assistants
   c. Technicians
   d. Specialists
   e. Professional staff
4. General organizational structure
   a. Administration
   b. Departments
5. General functions and services of libraries
   a. Reference
   b. Circulation
   c. Maintenance of collections
   d. Selection and acquisition
   e. Media services
   f. Advisory
   g. Services
      (1) Public
      (2) Reader
      (3) Social
      (4) Informational
6. Types of libraries
   a. School libraries
      (1) Purposes of school libraries
      (2) Specific functions and services
      (3) Media services
      (4) Management and personnel structure
   b. Academic libraries
      (1) Purposes of academic libraries
      (2) Specific functions and services
      (3) Media services
      (4) Management and personnel structure
   c. Public libraries
      (1) Purposes of public libraries
      (2) Specific functions and services
      (3) Media services
      (4) Management and personnel structure
   d. Special libraries
      (1) Types of special libraries
      (2) Purposes of special libraries
      (3) Specific functions
      (4) Media services
      (5) Management and personnel structure
7. Organization and functions of library acquisitions center
   a. Acquisition systems
   b. Acquisition procedures
      (1) Request forms
      (2) Sources
      (3) Storage and organization of sources
      (4) Bibliographic search
      (5) Bibliographic tools
      (6) Purchasing procedures and files
      (7) Receiving and control
8. Maintenance procedures
   a. Mending and binding
      (1) Mending
      (2) Cleaning
      (3) Display preparation
9. Organizing and describing library materials
   a. Public catalog
      (1) Types of public catalogs
      (2) Catalog cards
   b. Main entry
      (1) Books
      (2) Nonprint materials
   c. Classification
      (1) Library of Congress

(2) Dewey Decimal System
d. Cross-references
e. Shelf lists
f. Library processing of nonbook materials
g. Cataloging aids
10. Readers' services
a. Types of readers' services
(1) In various types of libraries
(2) General reference information
(3) Periodical information
(4) Public catalogs
(5) General indexes
(6) Directories and dictionaries
(7) Handbooks
(8) Bibliographies
b. Specialized references
11. Library media services
a. General cataloging procedures
b. Classification procedures
c. Media technician in libraries

C. Laboratory
1. Field trips to various types of libraries to observe the functional areas, personnel organization, functions, and services
2. Exercises and lecture demonstrations of specialized library equipment such as microform facilities, filing and storage, processing facilities
3. Exercises or assignments to provide experience in library functions
4. Specific topical assignments providing experience in using the principal reference tools of libraries

IV. Administering Media and Equipment

A. Performance objectives

Upon completion the student should be able to:

1. List and briefly describe the objectives of media and equipment management
2. Prepare a list and brief description of common media and equipment
3. Given a list of common media and equipment, indicate the major considerations for acquisition, storage, distribution, maintenance, and inventory control
4. List the major indexes or sources of media
5. Locate specific media using major sources and prepare order, inventory, and control forms for the media
6. Given a list of common media, compare as to primary advantages and limitations and the specific equipment considerations of each
7. List and briefly describe the evaluation and selection criteria for several types of media
8. Devise (or follow) a plan for scheduling and distribution of media and equipment for a specified media center
9. Devise or modify example forms to be used for ordering, scheduling, distribution, utilization, and maintenance of media or equipment
10. Devise or prepare checklists for maintenance or repair of specific media and equipment including inspection and maintenance records
11. Process media or equipment for shelving and distribution
12. List and briefly describe several methods of cataloging and inventory control for specific media
13. Given a list of various types of media, describe the proper handling and care preceding, during, and following utilization
14. Given a specific inventory of media and equipment, prepare a list of necessary supplies and accessories for utilization
15. Given utilization data or demand information, prepare equipment requirements, specifications, pricing, and recommendations
16. Given the dimensions of a space and an inventory list of media and equipment, prepare plans and details showing shelving, storage arrangements, and facilities

B. Units of instruction
1. Administering media and materials
a. Kinds and types of media or materials
b. Print media and nonprint media
c. Purposes of media management
(1) To insure quality and appropriateness
(2) To avoid duplication
(3) To provide effective budget distribution
(4) To provide efficient and economic use of media and materials
(5) To promote utilization through service, availability
d. The selection process

(1) General selection criteria
(a) Curriculum relationships
(b) Authenticity
(c) Appropriateness
(d) Technical quality
(e) Economics
(2) Evaluation
(a) Specific evaluation criteria for various media
(b) Previews
(c) Evaluation forms and instruments
(3) Sources of media
(a) Trade journals
(b) Professional societies
(c) Industries
(d) Specific indexes
(e) Agency or institutional indexes
(f) Commercial catalogs or indexes
(4) Acquisition of media
(a) Budgeting factors
(i) Direct costs
(ii) Indirect costs
(iii) Priority budgeting
(b) Ordering and scheduling forms
(c) Rental and purchase plans
(d) Storage and space requirements
(i) Specialized facilities
(ii) Specific storage considerations
(iii) Layout of storage facilities
(e) Acquisition control
(i) Accession records
(ii) Confirmation of dates
(iii) Control forms
(5) Classifying and cataloging
(a) Card system
(b) Color coding or coding systems
(c) Commercial systems
(d) Computerized systems
(e) Systems for publicizing materials
(6) Scheduling and distribution
(a) Scheduling forms and methods
(b) Delivery and pickup of materials
(i) Control processes
(ii) Maintaining and repair of media
(c) Centralized and decentralized systems

2. Administering equipment
a. Analyzing equipment requirements
(1) Performance considerations
(2) Utilization
(3) Operational considerations
(4) Related media
b. Specific criteria for selection
(1) Standardization
(2) Mixed equipment
(3) Rentals vs. purchases
(4) Specifications and bids
(5) Competitive testing
(6) Selection factors for specific use
c. Storage of equipment
(1) Special facilities
(2) Maintenance and inspection
(3) Parts, replacements, accessories
(4) Records
d. Distribution and control
(1) Request or schedule instruments
(2) Operational instructions
(3) Student or club assistance
(4) Maintenance records
(5) Cataloging equipment
e. Budget considerations
(1) Present equipment
(2) Duplication of equipment
(3) Replacement scheduling
(4) Rentals vs. purchases
(5) Supplies and accessories
(6) Service contracts
(7) Expansion or creative budgeting

C. Laboratory
1. Field trip to area school system or school to review acquisition, cataloging, storage, and distribution systems
2. Prepare a list and brief description of common media and equipment indicating the major considerations for acquisition, storage, distribution, maintenance or repair, supplies and inventory control
3. Compile a list of major sources of media and equipment
4. Locate specific media using major sources, compile bibliographic information, and prepare order forms for these materials
5. Through simulated experiences, devise the necessary procedures and instruments to effectively schedule, distribute, and control media and equipment
6. Devise or prepare checklists for

maintenance or repair of specific media and equipment including inspection and maintenance records

7. Prepare equipment requirements, specifications, pricing, and recommendations for specific problems or utilization
8. Prepare a list of supplies and accessories necessary for utilization of equipment or media
9. Prepare plan and details showing shelving, storage arrangements, and facilities for storage and handling of media or equipment
10. Devise a training program for preparing students or media club members to assist in distribution, operation, and maintenance of media or equipment

V. Implementing and Administering Media Preparation Services

A. Performance objectives

Upon completion the student should be able to:

1. List and briefly describe the general and producer services that may be performed by a production center
2. Given specific demand information, evaluate and describe the production services required
3. Given a list of media and anticipated utilization, prepare information for evaluation of local production including equipment requirements, specifications, price, and sources
4. Given specific dimensions of a space and an equipment inventory, prepare plans and details for a production facility including workflow, scheduling, and utilities
5. Given a list of media, prepare a list, price and indicate sources of supplies necessary for production
6. List and briefly describe the major considerations of implementing, or evaluating the feasibility of implementing, production services
7. Given descriptive information about a production order, prepare a complete list and purchase orders for the necessary supplies, devise a production schedule, and estimate the time required for completion of the project

B. Units of instruction

1. Evaluation of production services
   a. General services
   b. Producer services
   c. Local vs. commercial services
   d. Analysis of demands
2. Space considerations
   a. Production planning
   b. Production layout
3. Equipment requirements
   a. Production
   b. Processing
   c. Finishing
   d. Professional services vs. local services
   e. Time and motion study
4. Evaluation of staff requirements
   a. Size of staff
   b. Duties of staff
   c. Qualifications of staff
   d. Training of personnel
5. Supplies — materials — requirements
   a. Inventory for production areas
   b. Procedures for quantity of inventory
   c. Storage and maintenance of inventory
6. General business functions
   a. Bookkeeping
   b. Ordering — purchasing
   c. Work orders and scheduling
   d. Inventory control
7. Budgeting for media production services
   a. Determination of costs
   b. Cost estimating
   c. Budget administration

C. Laboratory

1. Laboratory exercise in development of production service facility and capability, including service evaluation, organization, production planning, equipment, materials, operation, and budgeting

VI. The Physical Environment and Equipment for Media Utilization

A. Performance objectives

Upon completion the student should be able to:

1. List and describe the factors that must be considered in determining the suitability of any given space for mediated instruction
2. List and briefly describe current trends in media utilization and learning areas
3. List and compare the variables to be considered for utilization of media

equipment in various types of learning spaces such as large group, small group, or individualized instructional spaces
4. List sources of physical standards for mediated classrooms
5. Solve basic problems of layout, projection, lighting control, acoustics seating for specific-purpose learning spaces
6. Solve light control problems for various spaces or classrooms
7. List and recommend wiring, electrical services, and physical modifications for remodeling spaces
8. Specify equipment necessary for media facilitation of existing spaces

B. Units of instruction
1. Learning spaces
   a. Classrooms
   b. Multigroup spaces
   c. Multimedia centers
   d. Independent and individualized instructional spaces
   e. Fixtures
2. Physical considerations
   a. Lighting control
   b. Electrical requirements
   c. Acoustics and sound control
   d. Projection relations and problems
   e. Environmental control
   f. Seating
   g. Equipment storage
   h. Operational factors
   i. Standards for design
      (1) Recommended practice
      (2) Renovations and remodeling
      (3) Sources of standards
      (4) Consultants
3. Equipment requirements
   a. Analyzing equipment needs and utilization
   b. General criteria for selection
      (1) Operation
      (2) Location
      (3) Performance
      (4) Maintenance
      (5) Economics
      (6) Rentals vs. purchases
      (7) Supplies
   c. Specific selection criteria
      (1) Projectors
      (2) Audio equipment
      (3) Video equipment

C. Laboratory
1. Laboratory exercises in development, or basic design, of learning spaces, including layout, equipment considerations, environmental considerations, and utilities for a variety of user requirements

VII. Budgeting for Media Services

A. Performance objectives

Upon completion the student should be able to:
1. List and briefly discuss common budgeting systems
2. List and describe the items to be included in proposed budget for production, equipment, media, and materials
3. Prepare a budget for specific production services including supplies, equipment, materials, and staff for annual operation or projects
4. List and briefly describe the current standards or guidelines for media, equipment, or facilities
5. Prepare cost-estimating information for production services in relation to specific utilization information

B. Units of instruction
1. Introduction to types of budgeting
   a. Performance budgeting
   b. Object budgeting
   c. Continuity budgeting
   d. Expansion or creative budgeting
2. Analyzing the expenditures
   a. Media and materials
      (1) Purchase priorities
      (2) Rentals
      (3) Replacements
      (4) Supplies and accessories
   b. Equipment
      (1) New equipment
      (2) Replacements
      (3) Duplications
      (4) Maintenance or service
      (5) Supplies and accessories
   c. Preparation or production services
      (1) Supplies and materials
      (2) Equipment
      (3) Equipment repairs or replacement
      (4) Rentals
      (5) Service contracts
      (6) Overhead or utilities
      (7) Project estimates
   d. Staff expenditures
      (1) Full-time staff

(2) Part-time staff
(3) Professional services

e. Accounting procedures for budget control and distribution
f. Equipment and facility standards or guidelines
(1) Recommended equipment
(2) Recommended facilities
(3) Trends in equipment utilization
g. Budgeting for projects or proposals
h. Sources of revenue or support
i. Chargeback systems of operational accounting

C. Laboratory
1. Laboratory exercise in preparing cost estimates for production and distribution services for specific school system
2. Analysis of budgeting and accounting procedures of parent institution and local school or district
3. Using available standards or guidelines, laboratory exercises in budgeting for expanding operational levels of utilization, distribution, and preparation services
4. Laboratory exercises in evaluating costs of implementing a print-medium service for a specific school and utilization data

Texts and References

Erickson. *Administering Instructional Media Programs.*

Green. *Educational Facilities with New Media.*

American Library Association. *Standards for School Media Programs.*

Minneapolis Mining and Manufacturing Co. *Tape Recording in the Classroom.*

———. *Better Communications Through Tape.*

National Educational Association. *Instructional Television Fixed Service: What It Is . . . How To Plan.*

Minor and Frye. *Techniques for Producing Visual Instructional Materials.*

Brown, Norberg, and Srygley. *Administering Educational Media.*

Rennselaer Polytechnic Institute. *New Spaces For Learning.*

Educational Facilities Laboratories. *Instructional Hardware/A Guide To Architectural Requirements.*

Gerlach and Ely. *Teaching and Media.*

Hicks and Tillin. *Developing Multi-Media Libraries.*

Related Media

Bailey Films, Inc., 6509 Delonpre Avenue, Hollywood, Calif. 90028.

Bulletin Boards and Display. 35 min., 36 frames, color, 1966.
Summary: Amusing drawings and examples of good bulletin board design show how the bulletin board can function as an effective educational tool.

Bulletin Boards, An Effective Teaching Device. 16 mm., 11 min., color.

Flannel Boards and How To Use Them. 15 min., 16 mm., color.

Film and You (Using A Classroom Film). 13 min., 16 mm., color.

Library Filmstrip Center, 3033 Alomo, Wichita, Kans. 67211.

The Media Center. filmstrip, 53 frames, sd., record, 1969.
Summary: Description of Dewey Decimal System and application to audiovisual resources.

National Audio Visual Association, 1201 Spring Street, Fairfax, Va. 22030.

National Slide Library on A/V Media in Education. slides, 366 slides, color.
Summary: Demonstrate media and equipment in use.

Space Is Not Enough. 16 min., filmstrip, sd., color, 1969.
Summary: Details the technical and physical requirements of mediated instruction and their effect on overall design and shape of classrooms.

National Education Association, 7201 16th Street, N.W., Washington, D.C. 20036.

Educational Media. 16 min., filmstrip, sd., color, 1969.
Summary: Surveys media now available and discusses considerations in selecting and testing media.

Chandler Publishing Co., 124 Spear Street, San Francisco, Calif. 95104.

Pictures For Teaching. Slides, 36 frames, color, 1965.
Summary: Sources of pictures, selection of pictures, filing methods, uses, and examples.

McGraw-Hill Book Co., Inc., Textbook-Film Division, 330 W. 42d Street, New York, N.Y. 10036.

Filmstrips and the Teacher. filmstrip, 32 frame, color.

How To Use Classroom Films. 15 min., 16 mm., sd., b & w, 1963.

Making Learning More Meaningful. 12 min., 8 mm., color.

Choosing A Classroom Film. 18 min., 8 mm., color.

Selecting and Using Ready-Made Materials. 17 min., 8 mm., color.

Basic Skill Films, 1355 Inverness Drive, Pasadena, Calif. 91100.

An Example of a Teaching Machine Program. filmstrip, 35 mm., 62 frames, color, 1960.

Effectiveness of Audio-Visual Materials. filmstrip, 45 frames, color.

How To Use A Teaching Film. filmstrip, 30 frames, color, 1957.

Teaching By Television. filmstrip, 51 frames, color, silent, 1967.

Using Individual Learning Procedures in Teaching. filmstrip, 55 frames, color.

Eyegate House, 146-01 Archer Avenue, Jamaica, N.Y. 11400.

Facts About Films. MP, 11 min., 16 mm., sd., color.

Facts About Projection. MP, 11 min., 16 mm., sd., color.

How To Get The Most Out of Filmstrips. FS, 50 frames, sd., color.

APPLIED EDUCATIONAL MEDIA

Hours Per Week

Class, 0; Laboratory, 9

Description

Field training through work experience functioning as an instructional media technician with area educational institutions, agencies, industry, or the curriculum institution instructional resource center. Each student works directly with a mentor or project director in close cooperation with curriculum faculty to gain practical experience in equipment or material distribution, material production, and in working with instructional personnel on solutions to instructional problems. Periodic seminars will review individual experiences with collective efforts to evaluate problems associated with the individual experiences. Mentor or project director will provide a review of personal and performance characteristics of the student.

The student should spend 9-12 hours per week actively involved with the work experience. One hour per week should be arranged for a seminar or conference with the faculty supervisor for the purpose of discussion and evaluation of work experience.

Because of the wide variety of instructional resource facilities, agencies, institutions, or industries and consequently purposes and services, an equal variety of field experience may exist. Area or regional circumstances may preclude extrainstitution participation in which case a carefully planned and supervised institutional experience with the resource center, library, and faculty offers excellent potential. Deviations from the suggested course outline often will occur, but the primary objectives of the work experience should be maintained.

Major Divisions

I. Media Production Services (General)
II. Media Production Services (Producer)
III. Media and Media Equipment Distribution
IV. Final Seminar and Evaluation

I. Media Production Services (General)

A. Performance objectives

Upon completion the student should be able to:

1. Prepare original artwork for illustrations, designs, posters, charts, maps, diagrams, displays
2. Prepare or reproduce overhead transparencies using standard and photographic processes
3. Prepare artwork and graphics for television, photography, film
4. Prepare original 35 mm. slides for screen or television
5. Prepare duplicate 35 mm. slides for screen or television
6. Prepare captions for 35 mm. slides for screen or television
7. Produce black and white prints including camera and darkroom processing
8. Mount, laminate, display photographs and artwork
9. Record audiotapes including live narrations, change of format, sound mixes, sound synchronizing, and editing
10. Reproduce print materials by copying, spirit, mimeo, and offset methods
11. Reproduce and duplicate print materials from both original and prepared copy
12. Prepared displays and exhibits

B. Laboratory

1. Production planning and scheduling
   a. Consultation
   b. Design
   c. Production
   d. Economics
   e. Facilities
   f. Supplies
   g. Production coordination
2. Production techniques
   a. Art and design — graphics
   b. Media photography
   c. Reprographics
   d. Audio

C. Seminar

1. Discuss procedures and problems of general media design center services
2. Discuss general procedures for consultation, design, scheduling, and production of general media
3. Discuss general work attitudes
   a. Job responsibilities
   b. Responsibilities to follow workers, employers, clientele
   c. Quality of workmanship

4. Discuss procedures for inventory control, supplies utilization, cost estimating, and scheduling of work

II. Media Production Services (Producer)
A. Performance objectives
Upon completion the student should be able to:
1. Produce sound slide and sound filmstrip programs including artwork, photography, processing, audio, in cooperation with media and subject matter specialists
2. Assist production of motion pictures in S-8 format, including camera, artwork, lighting, editing using motion, single-frame, basic animation, special-effects techniques
3. Assist production of video tapes, including both studio and on-location productions
4. Assist preparation of production storyboards and scripts for slide, filmstrip, film, television services
5. Reproduce and duplicate print materials such as brochures, manuals, and workbooks

B. Laboratory
1. Production planning
a. Consultation
b. Design
c. Development and analysis
d. Budget
e. Scheduling
f. Production
2. Production staff
a. Media specialists
b. Subject matter specialists
c. Technicians and support staff

C. Seminar
1. Discuss planning, analysis, coordination, staff roles and responsibilities, scheduling and budget requirements of producer services
2. Discuss staff relationships and responsibilities in media services

III. Media and Media Equipment Distribution
A. Performance objectives
Upon completion the student should be able to:
1. Check in-house files, locate bibliographic information and prepare orders for media and equipment
2. Receive, catalog, and process media and equipment
3. Maintain public media catalogs
4. Maintain records of utilization, maintenance, storage of media
5. Select procedures for scheduling, distribution, and inventory control of media and equipment
6. Maintain and repair media and media equipment
7. Set up, operate and supervise the operation of media equipment
8. Instruct clientele in the operation of media equipment
9. Prepare and maintain an inventory of supplies for media and media equipment repair or maintenance
10. Schedule, distribute, store inventory media and media equipment
11. Assist in evaluation and preview of media
12. Supervise the operation of equipment for viewing, listening, or distribution centers
13. Operate equipment to distribute video, audio, or visual media

B. Laboratory
1. Acquisition of media and equipment
a. Rentals
b. Purchase
2. Organization of media and equipment
a. Cataloging
b. Receiving and processing
c. Recordkeeping
3. Distribution of media and equipment
a. Scheduling
b. Storage
c. Inventory
d. Recordkeeping
4. Operation and maintenance of media and equipment
a. Maintenance and repair
b. Preventative maintenance
c. Storage
d. Scheduling
e. Operational assistance, supervision, instruction
5. Distribution and distribution facility operation
a. Audio, video, visual equipment
b. Scheduling
c. Recordkeeping

C. Seminar
1. Discuss the procedures and problems of acquisition, organization, distribution,

storage of media and media equipment
2. Discuss the procedures and problems of media and media maintenance, repair, storage, and preventative maintenance
3. Discuss techniques for effective guidance and supervision of equipment operators, students or other staff
4. Discuss responsibilities of technicians in acquisition, organization, distribution, operation of media equipment

IV. Final Seminar and Evaluation
A. Performance objectives
Upon completion the student should be able to:
1. Define the role and responsibility of the educational media technician as a member of an instructional resource staff
2. Discuss attitudes and job-related responsibilities of media technicians
3. Explain procedures, policies, production techniques of the institution, agency, or industry involved in the work experience
4. Prepare a summary or resume of the work experience

B. Seminar
1. Discussion of general work attitudes, responsibilities, and employer, fellow employee, clientele relationships
2. Discussion and evaluation of job performance and attitudes of supervisor and faculty

Texts and References

None

MATHEMATICS

Hours Per Week

Class, 3; Laboratory, 0

Description

The material in this course is designed to increase the student's mathematical abilities and to develop his self-confidence. The topics covered are those which the media student will likely encounter in the various technical courses and later in the field. The instructor is reminded that the mathematics principles to be taught in this course will be used as "tools" by the student. In this sense, it would be well to indicate to the student where such a principle is applicable to the media field.

Major Divisions

	Hours Class
I. Fundamental Concepts	7
II. Basic Algebraic Operations	5
III. Linear Equations and Equalities	
IV. Exponents, Radicals, and Logarithms	10
V. Special Products	2
VI. The Slide Rule	5
VII. Trigonometry	11
Total	45

I. Fundamental Concepts

A. Performance objectives

Upon completion the student should be able to:

1. List and describe the symbology of the decimal system
2. Write a fraction in lower or higher equivalent terms
3. Add and subtract fractions having the same denominator
4. Compute the least common denominator of several fractions
5. Compute quotients by either the common denominator or inverted divisor method
6. Solve a complex fraction
7. Compute the sum or difference of numbers expressed as decimals
8. Compute the product or quotient of numbers expressed as decimals
9. Determine an appropriate result in rounding off a number expressed as a decimal
10. Find the percent of a given number
11. Find the percent one number is of another
12. Find a number when a percent of it is given
13. Solve simple ratio and proportion problems

B. Units of instruction

1. Basic operations in arithmetic
   a. Addition, subtraction, multiplication, and division of whole numbers
   b. Addition, subtraction, multiplication, and division of fractions and mixed numbers
   c. Addition, subtraction, multiplication, and division of decimals
   d. Operations with percentage, ratio, proportion, and variation

II. Basic Algebraic Operations

A. Performance objectives

Upon completion the student should be able to:

1. List and define the basic terminology of algebra such as: variable, constant, coefficient, powers
2. Solve basic problems using law of sines
3. Compute the product of several monomials
4. Compute the product of monomials and polynomials
5. Compute the product of two polynomials
6. Compute the sum and difference of like terms
7. Compute the quotient of two monomials and a polynomial divided by a monomial

B. Units of instruction

1. Concept and definition of a function
2. Expression of a functional relation by tables and graphs
3. Addition, subtraction, multiplication, and division of simple algebraic ex-

pressions
4. Polynomials; addition — subtraction
5. Polynomials divided by monomial

III. Linear Equations and Equalities
A. Performance Objectives
Upon completion the student should be able to:
1. Solve a linear equation in a single variable
2. Solve simple word problems by equation
3. Graphically represent a linear equation on cartesian coordinates
4. Solve a system of two linear equations in two variables by:
a. Substitution
b. Addition or subtraction
B. Units of instruction
1. The Cartesian coordinate system — anotipoint plotting
2. The graph of equations, $y = kx$, $y = kx + b$
3. The graphical solution of two linear equations
4. Algebraic solution of linear equations, one and two unknowns

IV. Exponents, Radicals, and Logarithms
A. Performance objectives
Upon completion the student should be able to:
1. Solve basic problems using the law of exponents
2. Solve basic problems involving negative exponents
3. Solve equations involving roots and fractional exponents
4. Solve simple problems using logarithms
B. Units of instruction
1. The laws of exponents
2. Integer exponents
3. Fractional exponents
4. Relation between fractional exponents and radicals
5. The complex number and its meaning
6. Definition and properties of logarithms
7. Operations with logarithms
8. Use of log tables
9. Relationship of base 10 and base "e" logs

V. Special Products
A. Performance objectives
Upon completion the student should be able to:
1. Compute the product of two algebraic fractions
2. Compute the quotient of two algebraic fractions
3. Compute the sum or difference of two algebraic fractions
B. Units of instruction
1. Compute the product, quotient, sum of two algebraic fractions
2. Equations with algebraic fractions

VI. The Slide Rule
A. Performance objectives
Upon completion the student should be able to:
1. Describe and distinguish between the graduations on a slide rule
2. Compute the products and quotients using the C-D scale
3. Determine the decimal point location of a number
4. Solve a proportion using the slide rule
5. Square or cube a number using a slide rule
6. Find the square root or cube root of a number using the slide rule
B. Units of instruction
1. A, B, C, D scales
2. Multiplication and division
3. Squares and square roots
4. Combine operations
5. Scientific notation and significant figures

VII. Trigonometry
A. Performance objectives
Upon completion the student should be able to:
1. Recognize the relationships of a right triangle (Pythagorean theorem)
2. Recognize the fundamental trigonometric functions of:
a. Sine, cosine, tangent contangent, secant, cosecant
3. Use the values found in the trigonometric table
4. Solve a right triangle problem
B. Units of instruction
1. Relation between degree and radian measurement
2. Definition of trig functions (acute angle)
3. Tables of trig functions and interpolation of tables

4. Solution of right triangles
5. Slide rule — trig scales
6. The law of sines
7. Extension of functions for angles greater than 90°
8. Graphs of the six functions
9. Sums and differences of curves
10. Angular motion and arc length

Texts and References

Ayres, Fry, and Jonah. *General College Mathematics*
Hall and Kattsoff. *Unified Algebra and Trigonometry*
Jaeger and Bacon. *Introduction to College Mathematics*
Juszli and Rodgers. *Elementary Technical Mathematics*
Nanny and Shaffer. *Arithmetic, A Review*
New York Institute of Technology. *Algebra and Trigonometry: A Programmed Course with Applications*

Related Media

Ealing, 2225 Massachusetts Avenue, Cambridge, Mass. 02140
The Slide Rule — Why It Works.
The Slide Rule — Multiplication.
The Slide Rule — Division.
6 min., 8 mm., S — 8 mm. film loops.
Summary: Instructional film loops showing use of scales to perform operations on the slide rule.

COMMUNICATION SKILLS I

Hours Per Week
Class, 3; Laboratory, 3

Description

This course emphasizes exercises in writing, speaking, and listening. Analysis is made of each student's strengths and weaknesses. The instruction is planned principally to help students improve skills in which they are weak. The time allotments for the various elements within major divisions will depend upon the background of the class.

Technical reporting should be considered early in the course because of its importance in the orientation of the technician to his development and use of communication skills.

The laboratory exercise offers an opportunity for improved teacher-student communication and individual instruction. Laboratory assignments will be individualized to watch the student's background and abilities. A portion of the laboratory time will be devoted to remedial work, improving reading efficiency and English usage. The laboratories as well as the lecture periods will be accompanied by homework assignments.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Reading and English Comprehension Test	1	3
II. Communication and the Media Technician	3	3
III. Use of Resource Material	4	6
IV. Investigating and Designing Written Expression	4	6
V. Sentence Structure	6	9
VI. Developing Writing Abilities	20	13
VII. Talking and Listening	10	8
Total	48	48

I. Reading and English Comprehension Test
- A. Performance objectives
  Upon completion the student should be able to:
  1. Demonstrate a degree of proficiency in reading and comprehension and develop a suitable program to provide remedial or reinforcing exercises in areas of weakness
- B. Units of instruction
  1. Purpose of tests
  2. Use of tests
- C. Laboratory
  1. Administration of tests
     a. Reading
     b. English comprehension

II. Communication and the Media Technician
- A. Performance objectives
  Upon completion the student should be able to:
  1. List and describe the work of media technicians requiring proficiency in communication skills
  2. Describe the various media formats using written communication and application of written communication to such media
  3. Describe the areas of the media field requiring formal and informal verbal communications
- B. Units of instruction
  1. Survey of the media technician's need for proficiency in communication
  2. Discussion of written communication as an essential skill. (Use examples of media in newspapers, magazines, films, filmstrips, and other printed materials to promote an interest in the application of communication skills in a variety of situations)
     a. Statements and facts
     b. Expression of ideas
     c. Technical reporting
        (1) Formal
        (2) Informal
     d. Use of media to illustrate written communications
  3. Discussion of oral communications as an essential skill
     a. Person-to-person expression of ideas and thoughts
     b. Verbal reporting
     c. Use of media in oral communications
- C. Laboratory
  1. Group discussion of test results
  2. Development of individual study schedules to provide remedial exercises for the improvement of reading and English skills

III. Use of Resource Material

A. Performance objectives

Upon completion the student should be able to:

1. State the general purposes of libraries
2. List and briefly describe the primary catalogs and information services of a library
3. List and briefly describe the primary reference sources of a library
4. Locate and find basic materials and specific topic references through use of catalogs and indexes

B. Units of instruction

1. Orientation in use of school library
   a. Library of Congress system or Dewey Decimal system, as appropriate
   b. Use of card catalog and encyclopedias
   c. Location of reference materials
   d. Mechanics for effective use
2. Dictionaries
   a. Types
   b. Use
   c. Meanings of diacritical markings and accent markings
3. Introduction to other reference sources
   a. Technical manuals and pamphlets
   b. Bibliographies
   c. Periodicals
   d. Use of specialized indexes
   e. Technical and media handbooks

C. Laboratory

The student is assigned several projects which will provide experience in using the library facilities. Objective worksheets to be used which will cover many of the major problems a technician might encounter in using library resources and developing an approach to researching a topical area. These exercises will include use of card catalogs, atlases, encyclopedias, dictionaries, Readers' Guide to Periodical Literature, and other resources.

IV. Investigating and Designing Written Expression

A. Performance objectives

Upon completion the student should be able to:

1. List and describe the function of the primary parts of speech
2. Correctly use rules for basic language arts skills
3. Use the dictionary and rules of spelling
4. Use reference sources for vocabulary
5. Prepare complete, clear, concise, correct statements
6. Evaluate sentences and correct

B. Units of instruction

1. Types of written expression
   a. Narration, description, and exposition
   b. Inductive and deductive reasoning; syllogisms
   c. Figures of speech; analogies; comparisons and contrasts
   d. Cause-and-effect reasoning
   e. Media related
2. Choosing the subject
3. Limiting the subject
4. Determining the purpose
5. Gathering, selecting, and organizing the materials

C. Laboratory

The student is assigned exercises on the different types of written expression

V. Sentence Structure

A. Performance objectives

Upon completion the student should be able to:

1. Write complete sentences and identify the elements
2. Write expository sentences in which the basic concepts are modified by a variety of structures
3. When given a paragraph, analyze it for organizational structure
4. Write clear, complete sentences and paragraphs demonstrating correct spelling, vocabulary, and structure

B. Units of instruction

1. Review of parts of speech and their function
2. Language usage
   a. Explain that language arts skills cover several areas. Students should clearly understand the following to correct deficiencies in language usage
      (1) Noun-verb agreement
      (2) Punctuation
      (3) Capitalization
      (4) Possessives
      (5) Correct sentence structure
      (6) Clarity of written expression
      (7) Use and placement of modifiers, phrases, and clauses

b. Sentence structure
3. Spelling — importance of correct spelling of words for any written expression
4. Vocabulary
a. Knowledge of word meaning
(1) Exercises in common roots
(2) Prefixes
(3) Suffixes
(4) Synonyms
(5) Antonyms
(6) Homonyms
(7) Word division
b. Correct usage
5. Study of complete, clear and concise, correct statements

C. Laboratory
Laboratory exercises in sentence structure

VI. Developing Writing Abilities
A. Performance objectives
Upon completion the student should be able to:
1. List and briefly describe principles of graph construction
2. Prepare concise, clear paragraphs, correct in grammar, vocabulary, punctuation, and structure

B. Units of instruction
1. Paragraph construction
a. Review parts of speech
b. Study the gathering, selecting, and organizing of materials
(1) Defining terms
(2) Specific words and ideas
(3) Types of meaning — connotative and denotative
c. Developing the central idea: forming; stating; supporting
2. Grammatical convention
a. Forms, mechanics, and usage
(1) Grammar (reviewed as required)
(2) Punctuation — when to use
(a) Period, question mark, and exclamation point
(b) Comma
(c) Semicolon
(d) Colon
(e) Dash
(f) Parentheses
(g) Apostrophe
b. Sentences, phrases, special forms
3. Capitalization
4. Spelling
a. Word division — syllabication
b. Prefixes and suffixes
c. Word analysis and meaning — context clues and phonetics
5. Troublesome problems
a. The sentence fragment and run-together sentence
b. Commonly misspelled words and penmanship
c. Verb-subject agreement, tense
d. Paragraphing — statement and development
e. Punctuation and capitalization
6. Provision for individual differences in expression

C. Laboratory
Exercises in written expression which range from simple paragraphs requiring no research through those requiring research. Homework assignments will require considerable research and will be related to media use

VII. Talking and Listening
A. Performance Objectives
Upon completion the student should be able to:
1. List and briefly describe the elements of effective speaking
2. Describe the steps in preparation of brief verbal presentations
3. Make verbal presentation
4. Effectively listen and analyze verbal presentations

B. Units of instruction
1. Talking
a. Organization of topics or subjects
b. Directness in speaking
c. Conversation courtesies
d. Semantics — the understanding of word expression
e. Group discussions — organization and procedures
f. Salesmanship of speaking
(1) Effect of intensity
(2) Effect of quality
(3) Effect of articulation
(4) Gesticulation and use of objects to illustrate
2. Listening
a. Note taking
b. Concentration
(1) Principles of meaningful connections
(2) Active vs. passive listening
(3) Principle of whole method vs. part method

(4) Developing skill in summarizing
(a) Outline
(b) Digest or brief
(c) Criticism

C. Laboratory

Students are given exercises requiring the development of written and oral expressions. Students present such developments before the group during laboratory time. Presentations followed by group criticism. Guest speakers are used to provide student experience in note taking, listening, judging presentations, and as an informational broadening experience

Texts and References

Cowan. *Plain English, Please.*
Deese and Morgan. *How To Study.*
Johnson, Schalenkam, Garrison. *Communications — Handling Ideas Effectively.*
Postman. *Television and The Teaching of English.*
Sherman. *Modern Technical Writing.*

Related Media

Coronet Films, Inc., Coronet Building, Chicago, Illinois 60601
Improve Your Punctuation. 11 min., 16 mm., Sd., B & W or color.
Summary: Mechanics and usage of correct punctuation and review of common errors

PHYSICS

Hours Per Week

Class, 3; Laboratory, 3

Description

This course presents the fundamental topics of heat, light, sound, electricity, and mechancis with emphasis upon those topics pertinent to the media technician and related to media equipment. Through laboratory exercises, the basic principles are directly applied to media equipment to develop an understanding of operation. The basic testing and tool skills are developed for operation and maintenance of equipment together with technical terminology for specification of media equipment. As this course develops many of the concepts on which media equipment operation and maintenance are based, it is necessary to carefully relate topical areas to avoid duplication or omission of basic skills or concepts.

Figure 8—Some Educational Media Technicians expand their background in electricity and electronics to function as studio technicians.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Introduction to Physics	3	6
II. Light	9	9
III. Sound	9	9
IV. Heat	2	3
V. Electricity	23	15
VI. Mechanics	3	6
Total	48	48

I. Introduction to Physics
- A. Performance objectives
  1. Define some of the precise language necessary to the study of physics
  2. Describe the fundamental standards of mass, length, and time in both the metric and English systems of measurement
  3. Make accurate and precise measurements and computations
  4. Define and describe the fundamental properties of matter
  5. Define and describe fundamental quantities and units
  6. Discuss in writing the relationship of the principles of physics to media technology and media equipment
  7. Define the three states of matter
  8. Define the basic properties of gases, liquids, and solids
- B. Units of instruction
  1. Reasons for studying physics
     a. Precise language
     b. Importance of accurate measurements and standards
     c. Fundamental properties of matter
  2. Measurement
     a. Standards
        (1) length
        (2) mass
     b. Basic units, derived units, and conversion of units
  3. Vectors
     a. Vectors vs. scalars
     b. Graphical and mathematical operations with vectors
  4. Properties of solids
     a. Density
     b. Elasticity
     c. Hooke's Law
     d. Stress-strain
     e. Young's modules
     f. Hardness, ductility
  5. Properties of liquids
     a. Hydrostatics
        (1) Archimedes' principle
        (2) Force, pressure
     b. Buoyancy
  6. Properties of gases
     a. Boyle's Law
     b. Charles' Law
     c. Pressure gauges
- C. Laboratory
  1. Determine the force required to stretch

a spring a given distance in grams. Convert to pounds.
2. Determine the tracking force of a tone arm of a phonograph
3. Determine the strain of a certain film (or tape) caused by a given force

II. Light

A. Performance objectives

Upon completion the student should be able to:

1. Describe the general behavior and fundamental nature of light
2. Solve problems involving luminous intensity and flux
3. List and describe several sources of light
4. Describe the sensation of color
5. Describe how color can be produced by selective absorption or reflection of light
6. Describe briefly the science of color mixing and analyzing
7. Describe the control of light rays by reflecting or refracting media
8. Solve basic lens problems or computations

B. Units of instruction

1. Propagation of light
   a. Waves
   b. Rays
   c. Planck's Law (photons vs. waves)
2. The spectrum
   a. Visible
   b. Invisible
3. Sources of light
   a. Thermal
   b. Gas discharge
   c. Luminescent
   d. Infrared
   e. Ultraviolet
   f. Fluorescent lighting
   g. Photodiode
   h. Laser
4. Velocity
5. Photometry
6. Reflection, refraction, and diffraction
   a. Reflection at plane surfaces
   b. Reflection at curved surfaces
   c. Refraction
   d. Dispersion by defraction
7. Lenses and optical equipment
   a. Lenses
      (1) Converging
      (2) Diverging
      (3) Fresnell
   b. Lens combination and applications
      (1) Telephoto
      (2) Microscopes
      (3) Camera
      (4) Projectors
   c. Aberration
      (1) Spherical
      (2) Achromatic
   d. Polarization

C. Laboratory

1. Construct a pinhole camera. Predetermine image size and distance and focal length. Prove by exposing and processing film
2. Verify the photometric equation

$$\frac{(I_X}{(I_S} = \frac{d_X^2)}{d_S^2)}$$

by construction of a Rumford's photometer
3. Use two cameras of different focal lengths to take the same picture. Predetermine correct f stop for each to achieve proper exposure
4. Determine the projected size of a given image on 35 mm. slide, given projector to screen distance and focal length of lens. Use various lenses in projector
5. Investigate the relationships between lens and mirror systems for rear screen projection. Report will contain drawings of all principles of light in the system

III. Sound

A. Performance objectives

Upon completion the student should be able to:

1. Describe the nature and role of sound in our daily lives
2. Define and describe the basic characteristics of sound and sound waves
3. Describe some of the principles of acoustical treatment of rooms or spaces
4. Apply the basic technical concepts of sound to control sounds for useful purposes

B. Units of instruction

1. Production of sound
   a. Wave motion
      (1) Longitudinal

(2) Transverse
b. Frequency
c. Characteristics of sound
(1) Pitch
(2) Intensity
d. Reflection
e. Interference and absorption
f. Doppler effect
g. Harmonics
2. Sound sources
a. Human voice
b. Musical instruments
3. Audition
a. Human ear
b. Limitations of hearing
c. Architectural acoustics
d. Musical scale
4. Reproduction of sound

C. Laboratory
1. Calculate the reverberation time of a specified room to determine its suitability for (a) speech, (b) music. If not suitable, recommend alterations
2. Determine the acoustic power of a loudspeaker to produce a given sound level at some predetermined point

IV. Heat

A. Performance objectives

Upon completion the student should be able to:
1. Solve basic calorimetric problems
2. List and briefly describe the basic thermal properties of materials
3. Predict the effects of temperature changes on various elements
4. Describe and distinguish between various changes of state
5. Apply fundamental principles of heat transfer to solution of practical problems and evaluation of detrimental effects

B. Units of instruction
1. Temperature, units
a. Heat, units
b. Specific heat
c. Ignition point
2. Thermal expansion
a. Solids
(1) Differential expansion
(2) Area
(3) Volume
b. Gases
3. Change of phase
a. Melting and freezing point
b. Boiling point
c. Triple point
d. Humidity
4. Heat transfer
a. Conduction
b. Convection
c. Radiation
5. Principles of air conditioning

C. Laboratory
1. Given various types of lamps of uniform wattage, determine the surface temperature of each. Determine reasons for differences
2. Place a 25-watt lamp bulb inside a closed can. Plot the rate of temperature rise of the can until it stabilizes. Explain what has occurred. Replace bulb with bulb of a different wattage. Predetermine temperature of the can. Check analytical results with actual

V. Electricity

A. Performance objectives

Upon completion the student should be able to:
1. Describe the basic phenomena of electric current
2. Define basic electrical units
3. Solve simple electrical circuit problems including series and parallel ac and dc circuits
4. Use basic meters, measuring, or monitoring equipment to test electrical circuits or components
5. Describe basic electronic components and relate their function to media equipment operation
6. Test basic electronic components such as amplifiers
7. Describe the basic operating principles and components of standard communication devices

B. Units of instruction
1. Nature of electricity — the electric theory
a. Conductors — specific resistance
b. Insulators — dielectric strength
2. Electrical units
a. Amperes
b. Volts
c. Ohms
d. Watts
3. Magnetism

a. Permanent and electromagnets
b. Law of magnets and magnetic fields
c. Application of magnets

4. Basic electric circuit and components
   a. Ohm's law in dc series resistance circuits
   b. Ohm's law in dc parallel
   c. Measurement of resistance
      (1) Volt — ammeter method
      (2) Ohmmeter
   d. Wire size and voltage drop in lines
   e. Inductance in dc circuits
      (1) Lenz's law
      (2) Concepts and units of self-induction
      (3) Energy in induction circuits
      (4) Mutual inductance — coefficient of coupling
      (5) Series and parallel inductance
   f. Capacitance in dc circuits
      (1) Definition and units of capacitance
      (2) Rise and decay of voltage in a capacitor
      (3) Energy in capacitive circuits
      (4) Capacitors in series and parallel
   g. Alternating currents
      (1) A.C. circuits in resistance, capacitance, and inductance
      (2) Measurement of alternating current
      (3) The electromagnetic spectrum — high frequencies
      (4) Electrochemical analogies
         (a) Resistance — friction and power consumption
         (b) Inductance — inertia: kinetic energy
         (c) Capacitance — potential energy

5. Basic electronics
   a. Controlling electric current: rheostat, vacuum tube, and transistor
   b. Electron tubes
      (1) Thermionic emission
      (2) Diode and Triode
         (a) Characteristic curves
         (b) Application and uses
      (3) Cathode-ray tube
   c. Solid-state devices
      (1) Nature of materials
      (2) Mechanisms of conduction in semiconductors
      (3) Resistance to heat, shock, and chemical action
   d. Electronic measuring deviczy
   e. Principies of amplifiers: voltage, power
   f. Principles of oscillators

6. Electrical power
   a. Sources of electricity
      (1) Generators
      (2) Thermocouple
      (3) Photocells
      (4) Solar cells
      (5) Batteries
   b. Uses
      (1) Heat and light
      (2) Chemical
      (3) Motors
         (a) Common ac and dc motors
            (i) Series, shunt, universal
            (ii) Fractional horsepower motors

7. Communication devices
   a. Telephone
      (1) Basic components
      (2) Telephone circuitry
   b. Radio
      (1) Electromagnetic waves
      (2) Transmitters
      (3) Receivers
      (4) AM vs. FM
   c. Television
      (1) Camera
      (2) Kinescope
      (3) Color

C. Laboratory
1. Using 25-, 50-, 75-watt lamps, wire them in series, measure voltage and currents through each one. Repeat with lamp wired in parallel. Explain the readings
2. Compute, using a wattmeter, the power consumption for a media display involving existing equipment including slide projectors, motion picture projectors, television equipment. Determine if a standard classroom will supply the needed power
3. Demonstrate, by use of an oscilloscope, dc power supply and signal generator, the difference between ac and dc. Examine the operation of the three basic components (resistance, capacitance, inductance) as applied to ac and dc circuits

4. Demonstrate the use of transformers in alternating current circuits and discuss the common types of service found in industrial, commercial buildings: single phase: 2 wire, 3 wire; three phase: 3 wire, 4 wire
5. Demonstrate, showing effect of reduced voltage sources on output of electrical devices and equipment. Varying voltage on light bulbs and taking necessary instrument readings, show effects of reduced voltage on motors
6. Examine a small radio and determine where any aspect of electrical fundamentals applies in individual components. Describe each application of an electrical fundamental

VI. Mechanics

A. Performance objectives

Upon completion the student should be able to:

1. List and describe the basic principles of mechanics
2. Solve simple problems dealing with force and motion
3. Solve problems dealing with simple machines

B. Units of instruction

1. Force and motion
   a. Gravity
   b. Other forces
   c. Motion
      (1) Velocity
      (2) Acceleration
   d. Inertia
   e. Action and reaction
2. Work and energy
   a. Work
   b. Energy
      (1) Units
      (2) Conservation of energy
   c. Momentum
3. Machines
   a. Lever
   b. Inclined plane
   c. Friction
      (1) Rolling friction
      (2) Bearings
   d. Screws
   e. Pulleys and wheels
   f. Gears
4. Power transmission
   a. Rotary motion
   b. Torque
   c. Shafts
   d. Centripetal force
   e. Centrifugal force

C. Laboratory

1. Using a 16 mm. motion picture projector as a power source, construct a pulley system (resin-coated twine as belt) to drive a homemade television "crawler"
2. Determine the velocity of a tape takeup reel when it is one-half full, three-fourths full; compare to actual

Texts and References

Harris and Hemeling. *Introductory Applied Physics.*
Shortley and Williams. *Elements of Physics.*
Smith and Cooper. *Elements of Physics.*
White, Manning, and Weber. *Basic Physics.*

Related Media

Coronet Instructional Films, 65 E. So. Water Street, Chicago, Illinois

Introduction to Physics. 11 min., 8 mm., Sd., color
Summary: Relates principles of physics and physical sciences to society and technology.

Measurement in Physical Science. 14 min., 16 mm., Sd., color.
Summary: Presents the importance of precise measurements and methods of measurement, basic units, and tools.

McGraw-Hill Films, 330 W. 42d. Street, New York, N.Y.

Solids, Liquids and Gases. 9 min., 8 mm., Sd., color.
Summary: Presents the classification of matter and differentiating properties of solids, liquids, and gases.

Encyclopedia Britannica Educational Corporation, 425 N. Michigan Avenue, Chicago, Ill.

Elasticity-Stress, Stress, Strain, Youngs Modulus, 30 min., 16 mm., Sd., color.
Summary: Concepts of compressibility and definition of stress, strain, and solid properties.

Atmospheric Pressure, 11 min., Sd., color.
Summary: Develops concepts of atmospheric pressure.

Gas Laws and Their Application, 14 min.
Summary: Develops the relationships between pressure, temperature, and volume with applications of gas laws.

Light Waves and Their Use, 11 min., 16 mm., B & W.
Summary: Illustrates principles of reflection and refraction through mirrors and lenses.

Sound and How It Travels, 11 min., 16 mm., color.
Summary: Defines sound and reveals mechanics of sound propagation.

Fundamentals of Acoustics, 11 min., 16 mm., B & W, Sd.
Summary: Discusses effects of surfaces upon sound reflection.

International Communication Film Division of Doubleday and Company, 1371 Reynolds Avenue, Santa Ana, Calif. 92705.

Basic Electricity and Magnetism Series, 3 min., 8 mm. or S-8 mm., color, 1964.

Summary: Series of film loops presenting topics on magnetism and basic electrical circuits.

Heat, 3-3/4 min., 8 mm., S-8 mm., film loops, color, 1964.

Summary Series of film loops presenting principles of heat and heat transfer.

Light, Waves, Sound, 1 min., 8 mm., S-8 mm., B & W film loops, 1964.

Summary: Series of film loops presenting principles and application of light, waves, sound.

Basic Home Electrical Wiring Series, 3-1/2 min., 8 mm., S-8 mm., color, 1968.

Summary: Vocational series illustrating wiring practice and methods.

International Film Bureau, Inc., 332 S. Michigan Avenue, Chicago, Ill. 60604

Television: Line By Line, 11 min., 16 mm., Sd., color, 1971.

Summary: Animated expianation of the technical principles of television. Relates physical principles of photo-electric effect and electrical and magnetic fields to applications in television.

COMMUNICATIONS SKILLS II

Hours Per Week
Class, 3; Laboratory, 3.

Description

A course in the practical aspects of writing and oral communication. Emphasis will be placed on applied communications, including business communications, abstracts, sales presentations, journalism, and scriptwriting. This course will include laboratory time for group discussion, remedial work, and class participation. Guest speakers will be used occasionally. Laboratories and lectures both require homework assignments.

Major Divisions

	Hours	
	Class	*Laboratory*
I. Components of Communication	3	3
II. Introduction to Reporting	2	4
III. Oral Reporting	8	15
IV. Written Reporting	18	18
V. Nonformal Reports	3	0
VI. Letters	6	9
VII. Special Types of Papers	8	3
Total	48	48

I. Components of Communication
- A. Performance objectives
  Upon completion the student should be able to:
  1. State and briefly describe the qualities of communication
  2. List and briefly describe the functions of communication
  3. Describe the considerations of topic, audience, circumstances in communications
  4. List and describe the functions of communications and organization to satisfy the functions
- B. Units of instruction
  1. Dynamics of communication
     a. Nature of people
        (1) Beliefs and motivation
        (2) Alone vs. interaction
        (3) Groups and/or organizations
     b. Nature of communication
        (1) Definition
        (2) Person-to-person contact
        (3) Person-to-group or group-to-person
        (4) Occasions of communication
           (a) Formal vs. informal
           (b) Use of information
           (c) Exchange of information
  2. Qualities of communication
     a. Communicating effectively
     b. Communicating efficiently
  3. Functions of communication
     a. To inform
        (1) Scope of information communication
        (2) Uses of information
        (3) Exchange of information
     b. To evaluate
        (1) Basis of evaluation
        (2) Content of evaluation
        (3) Methods of evaluation
     c. To instruct
        (1) Instructions and procedures
        (2) Training
        (3) Direction, implementation, and communication
     d. To influence and persuade
        (1) The nature of influence
        (2) Leadership and influence
        (3) Influence, decision, and expectation
        (4) Process and techniques of persuasion
     e. Other functions of communication
  4. Methods of communication
     a. Tools and techniques
        (1) Thinking and communication
        (2) Observing, reading, and listening
        (3) Communication tools
        (4) Proper, useful English
        (5) Interest and attention
     b. Media and communication
- C. Laboratory
  Laboratory exercises which will provide an intensive study of types of presentation. Group discussions and oral work

II. Introduction to Reporting
- A. Performance objectives
  Upon completion the student should be able to:
  1. List and differehtiate between various types of reports
  2. Describe the various uses of data in report preparation and reporting

3. Describe common methods of data presentation in reports
4. List and briefly describe common sources of data for reports or reporting

B. Units of instruction
1. Importance of reports
2. Purpose of reports
   a. Readers' needs
   b. Types of readers
3. Types of reports
   a. The scientific data
      (1) Meaning of the method
      (2) Characteristics of the scientific method
      (3) The problem concept
   b. The techniques of exposition
      (1) Definition
      (2) Use of diagrams, illustrative material, graphs, sketches, etc.
      (3) Analysis of examples
4. Use of data in reporting
   a. Data as basis for reports
   b. Sources of data
   c. Methods of recording data
   d. Evaluation and analysis of data

C. Laboratory
None

III. Oral Reporting

A. Performance objectives
Upon completion the student should be able to:
1. State the general parts of an oral report
2. Describe the general organization and other considerations in preparation of oral reports
3. List the steps in preparing oral reports
4. List and briefly describe media and materials to support oral reports
5. Describe briefly the most common objectionable mannerisms found in oral reports
6. Prepare and deliver oral reports of both a technical and nontechnical nature
7. List the primary considerations in selecting media for oral presentations
8. Conduct conferences, briefings, and instructional sessions
9. Analyze and critique oral reports in relation to technique, effectiveness, and media

B. Units of instruction
1. Preparing the presentation
   b. Semantics — the understanding of word meanings
   b. Organization of material for effective presentation
   c. Preparation of formal and informal oral reports
   d. Use of notes
   e. Use of slides and other media
   f. Proper control of body gestures and voice
   g. Elimination of objectionable mannerisms
   h. Maintenance of audience interest
   i. Methods of speaking over the air
2. Speech science
   a. Mechanisms of speech and hearing
   b. Basic drills for speech and voice
   c. The sounds of English
   d. English vowels
      (1) Diphthongs
      (2) Consonants
   e. Speech pathology
3. Conference and briefings
   a. Group communication
      (1) Leading conferences
      (2) Participating in conferences
      (3) Solving problems in conferences and meetings
   b. Briefings
      (1) Arranging and presenting briefs
      (2) Conducting briefings and presentations
4. Use of media in reporting
   a. Types of media
      (1) Drawings and diagrams
      (2) Tables
      (3) Bars, graphs, charts
      (4) Photographs and slides
   b. Selection of appropriate visual aids
   c. Use of media for oral reports
      (1) Readability
      (2) Clarity
      (3) Contrast
      (4) Timing
   d. Selection of appropriate media
      (1) Analysis of reader or listener
      (2) Analysis of information to be shown
      (3) Analysis of available materials

C. Laboratory
Practice in producing and effecting style for oral presentations. Student presentations and examples by guest speakers. Exercises to include taping, operational in-

structions, conferences, and evaluation of effectiveness

IV. Written Reporting

A. Performance objectives

Upon completion the student should be able to:

1. List and briefly describe the purpose of common types of reports
2. List the basic steps in preparing written reports
3. Prepare single objective reports correctly using the rules for report writing
4. List and briefly describe the legal aspects of use of information for report preparation
5. Demonstrate a basic knowledge of mechanics of report preparation by preparation of complete written reports
6. List and briefly describe the specific characteristics of special-purpose reports

B. Units of instruction

1. The report form
   a. Characteristics
   b. Functions
   c. Informal reports
   d. Formal reports
   e. Special types of papers
2. Methods of preparation of reports
   a. Outlining
   b. Use of cards
   c. Writing and rewriting
   d. Checking to see main points have been covered
   e. Deleting irrelevant material
   f. Picture or graphic material to use with report
   g. Correction of unclear statements and checking sentence structure and grammar, for:
      (1) Unity
      (2) Coherence
      (3) Emphasis
3. Writing the rough draft
   a. Procedure in writing the draft
      (1) Analyze the problem; make a tentative plan for organizing the report
      (2) Gather and analyze the information
         (a) Sources of information
         (b) Analysis of information
      (3) Plan the use of tables and figures
   b. Effective organization
      (1) Check outline for errors
      (2) Avoid undesirable extremes
      (3) Classification; parallel treatment of similar points
      (4) Logical allotment of space
      (5) Clearness
      (6) Use of media
   c. Effective style
      (1) Sentence length
      (2) Directness in sentence structure
      (3) Conciseness
         (a) Avoidance of:
            (i) Repetition
            (ii) Trivial details
            (iii) Wordy phrases
            (iv) Needlessly complicated sentence structure
         (b) Use of specific rather than general words
         (c) Content accuracy and terminology
      (4) Simplicity and concreteness of language
         (a) Avoidance of:
            (i) Pompous language
            (ii) Unnecessary technical vocabulary
            (iii) Hackneyed phraseology
            (iv) Vagueness
            (v) Technical errors
      (5) Precautions to be observed
         (a) Confidential information
         (b) Classified information
         (c) Copyrights and trademarks
         (d) Liability
      (6) Other parts of a written report
         (a) Cover
         (b) Title page and other preliminary pages
         (c) Abstracts or annotations
      (7) Editing, redrafting, and submitting reports
         (a) Correcting errors in usage
            (i) Vocabulary
            (ii) Capitalization
            (iii) Abbreviation
            (iv) Punctuation
            (v) Symbols and numerals
            (vi) Grammar
         (b) Correcting factual errors
         (c) Editing for conciseness and clarity
         (d) Working with typists and

other writers
(e) Checking the final draft
(f) Submitting the final report

C. Laboratory
Exercises in developing both oral and written reports. Presentation of reports in laboratory periods for group evaluation. Use of case studies to show effective and noneffective reporting. Lectures given by faculty to exemplify poor reporting and forceful reporting. Practice in note taking on these presentations
1. Typical problems for laboratory report
a. Definitions
b. Statements of problems, principles, and conditions
c. Recommendations
d. Descriptions
e. Comparisons
f. Narratives
g. Proposals
h. Inspection reports
i. Progress reports
j. Instructional reports
k. Technical articles
l. Scripts for a filmstrip, films, or video

V. Nonformal Reports
A. Performance objectives
Upon completion the student should be able to:
1. List and briefly describe the mechanics, format, and characteristics of common nonformal reports
2. Prepare nonformal report
B. Units of instruction
1. Journal articles
2. Reports made by filling in blank forms
3. Reports in form of memoranda
4. The periodic report
5. The progress report
6. The laboratory report
7. Descriptive reporting
C. Laboratory
None

VI. Letters
A. Performance objectives
Upon completion the student should be able to:
1. Describe the normal parts of a business letter
2. Describe common formats or styles of business letters
3. List and briefly describe the characteristics of common types of business letters
4. Prepare common types of business letters

B. Units of instruction
1. Business letters
a. The identification of parts of the letter
(1) Miscellaneous mechanical details
b. The substance of letters
(1) Standards of appearance, correctness, and accuracy
c. Unity in business letters
d. Need for planning before writing
(1) Arrangement of material in letters
(2) Language in the letter
e. Good will in business letters
2. Special types of letters
a. Invitation
b. Letters giving instructions
c. Letters of inquiry and answers to inquiries
d. Complaints and answers to complaints
e. Collection letters
f. Letters urging action
g. Form letters
h. The letter of application
(1) The opening
(2) Central section or body
(3) Personal information
(a) The data sheet
(4) References
(5) The ending

C. Laboratory
Exercises in preparing various types of letters. Analytical study of specimen cases. Oral work on job applications by use of application letter. Use of visuals to bring out details of types of letters, similarities and differences

VIII. Special Types of Papers
A. Performance objectives
Upon completion the student should be able to:
1. Prepare papers and reports to satisfy single objectives
B. Units of instruction
1. The abstract
2. Process explanation
3. The case history

4. The book, article, report review
5. Scriptwriting mechanics

C. Laboratory
Exercise in mechanics of scriptwriting

Texts and References

Brown. *Communicating Facts and Ideas in Business.*
Comer and Spillman. *Modern Business and Industrial Reports.*
Dean and Bryson. *Effective Communication.*
Graves and Hoffman. *Report Writing.*
Hays. *Principles of Technical Writing.*
Houp and Pearsall. *Reporting Technical Information.*
Marder. *The Craft of Technical Writing.*
Menning and Wilkinson. *Writing Business Letters.*
Merrihue. *Managing by Communication.*
Rhodes. *Technical Report Writing.*
Thayer. *Administrative Communication.*
Thomas. *Composition for Technical Students.*
Weisman. *Basic Technical Writing.*
Weiss and McGrath. *Technical Speaking.*
Zetler and Crouch. *Successful Communication in Science and Industry.*

See also texts and references listed for Communication Skills I.

INTRODUCTION TO SOCIOLOGY

Hours Per Week
Class, 3

Description

Basic social science principles are applied to significant aspects and problems of contemporary society. This course is directed toward increasing the student's awareness of fundamental social processes and social behavior. Through the process of analysis of social behavior and application of the methods and techniques of social research, the student will be better able to meet present and future challenges of society and culture.

The essential emphasis is on the development of the student's capacity to work with fundamental processes: use of speculation and hypothesis, formulation of theoretical models, and logical and intuitive reasoning.

Major Divisions

	Hours Class
I. Sociology and Methods of Sociological Inquiry	6
II. Culture and Society	16
III. Social Organization and Interaction	18
IV. Social and Cultural Change	8
Total	48

I. Sociology and Methods of Sociological Inquiry
- A. Performance objectives
  Upon completion the student should be able to:
  1. Describe some of the difficulties in applying scientific techniques to social and cultural phenomena
  2. List and briefly describe the principle sociological models of society
  3. Describe the fundamental techniques of sociological inquiry
  4. Distinguish between factual and inferential statements
  5. Employ the scientific techniques of sociology in the analysis and possible solution of various social problems
- B. Units of instruction
  1. The subject matter of sociology and the sociological perspective
  2. Sociological models of society
     a. Mechanistic, organic
     b. Functional-structural
  3. Sociological conceptions of man
  4. Methods of sociological inquiry
     a. Data collection
     b. Data interpretation — the uses of theory
  5. Social organization
     a. The individual and the organization
     b. Basic patterns of social organization

II. Culture and Society
- A. Performance objectives
  Upon completion the student should be able to:
  1. Recognize organizational patterns pertaining to cultural systems
  2. Differentiate between the roles of customs and beliefs
  3. Describe and analyze cultural symbols
  4. Describe and analyze cultural norms, mores, and folkways
  5. Explain and give examples of cultural relativity
  6. Specify and describe the relationship between social authority and individual liberty
- B. Units of instruction
  1. Nature and function of culture
  2. Culture and cultural variation
  3. Culture and social interaction
  4. The nature of norms
  5. Culture and human adjustment

III. Social Organization and Interaction
- A. Performance objectives
  Upon completion the student should be able to:
  1. Analyze social behavior in terms of primary groups, secondary groups, and the individual
  2. Select, systematize, and examine data pertaining to patterns of stratification
  3. Describe and analyze the significance of social class in American society
  4. Relate sources for changing family patterns
  5. Describe and explain the socialization pattern
  6. Interpret the interrelationship between culture, personality, and society

7. Describe the characteristics of populations
8. Describe and explain the interrelationship between environmental and ecological factors which influence the personality of the individual
9. Identify, analyze, and determine possible solutions for intergroup anagonisms and conflicts
10. Describe and analyze problems of the metropolitan area
11. Compare attitudes and characteristics of rural and urban societies
12. Identify future trends for urban society
13. Explain man's social experience in terms of social interaction

B. Units of instruction
1. Socialization
   a. Socialization of the child
   b. Adult socialization
   c. Socialization and the concept of self-identity
2. Primary groups
   a. The primary group and the individual
   b. The function of primary groups in large-scale organizations
   c. Group variation
3. Social stratification
   a. The determinants of socialization
   b. The effects of stratification
4. Formal organizations
   a. Formal and informal structures
   b. Communication and social status
   c. Leadership and interest groups
5. Collective behavior
   a. The nature of collective behavior
   b. Public opinion
6. Population and ecology
   a. Composition of populations
   b. Ecological patterns
7. The family
   a. Social organization; culture; socialization
   b. Primary relations and stratification
   c. Formal organization; collective behavior; population and ecology
8. Religion
   a. Social organization; culture; socialization
   b. Primary relations and stratification
   c. Formal organization; collective behavior; population and ecology
9. Education
   a. Social organization; culture; socialization
   b. Primary relations and stratification
   c. Formal organization; collective behavior; population and ecology

INTERIM EXAMINATION

10. Minorities
   a. Social organization; culture; socialization
   b. Primary relations and stratification
   c. Formal organization; collective behavior; population and ecology
11. Crime and delinquency
   a. Social organization; culture; socialization
   b. Primary relations and stratification
   c. Formal organization; collective behavior; population and ecology
12. Urban man
   a. Definitions and historical background
   b. Urban culture and urban change
   c. Studies of American cities
13. Industrial man
   a. Definitions and historical background
   b. The culture of work
   c. Technology and alienation
14. Political man
   a. The findings of political sociology
   b. Social revolution
   c. Power and freedom

IV. Social and Cultural Change

A. Performance objectives

Upon completion the student should be able to:
1. Develop criteria for the analysis of social and cultural change
2. Analyze the process of cultural accumulation, convergence, diffusion, and integration
3. Describe the effects of technological change on American culture and society
4. Describe some of the environmental and ecological effects on American culture and society

B. Units of instruction
1. Nature of social and cultural change
2. Causes of social and cultural change
3. Resistance and acceptance of social change
4. Technological and environmental forces

5. Integration of new cultural elements
6. Planning for change

Texts and References

Broom and Selznick. *Sociology: A Text With Adapted Readings.*
O'Brien, Schrag, Martin. *Readings in General Sociology.*
Bierstedt. *The Social Order.*
Rose. *Sociology: The Study of Human Relations.*
Merrill. *Society and Culture*

Related Media

Indiana University, Audio Visual Center, Bloomington, Ind.
Conflict. 18 min., 16 mm., Sd., B & W.
Summary: Examines series of routine conflict situations faced by a college student.

Conformity. 48 min., 16 mm., Sd., B & W.
Summary: Presents various examples of everyday conformity.

McGraw-Hill, 828 Custer Avenue, Evanston, Ill.
The Family. 29 min., 16 mm., Sd., B & W
Summary: Discusses changes taking place in the structure of the family.
Ask Me, Don't Tell Me. 22 min., 16 mm., Sd., B & W
Summary: Relates some causative factors in juvenile delinquency.
The City. 55 min., 16 mm., Sd., B & W
Summary: A documentary film presenting the problems of city planning.
Stress — A Disease of Our Time. 35 min., 16 mm., Sd., Color.
Summary: Discusses various stress situations emerging in our complex world.

PSYCHOLOGY AND HUMAN RELATIONS

Hours Per Week
Class, 3

Description

This course is concerned with developing a more comprehensive understanding of human behavior and of the various aspects of psychology and the behavioral sciences which can contribute to a sound philosopht of human relations. Fundamental concepts and precepts of human behavior, development, and human relations are presented to develop self-understanding and the ability to adjust to human problems of everyday life in the social and industrial world.

Major Divisions

	Hours Class
I. Introduction	4
II. Human Development	6
III. Basic Process of Behavior	6
IV. Individual Differences	6
V. Kinds and Nature of Learning	10
VI. Human Relations	12
Total	48

I. Introduction
- A. Performance objectives
  Upon completion the student should be able to:
  1. Describe in writing the biological bases of childhood behavior
  2. Describe in writing the scientific methods of psychology
  3. Explain briefly the way a human being develops through continuing interaction of heredity and environment
  4. Explain briefly neural aspects of behavior and psychology
- B. Units of instruction
  1. Introduction to psychology
     a. The subject matter of psychology
     b. Historical overview
     c. Schools of psychology
     d. Scientific methods in psychology
  2. The biological organism
     a. Biology and psychology
     b. The nervous system
     c. Functional anatomy of nervous system
     d. The brain
     e. The glandular system

II. Human Development
- A. Performance objectives
  Upon completion the student should be able to:
  1. List several social implications of personality development
  2. Describe briefly the concept of behavior genetics and the influence upon childhood development
  3. Identify the beginning stages of learning
  4. Define adolescence and adulthood in regard to psychological, social, and physical development
  5. Given alternatives, identify maturity by cognitive development
  6. List and discuss factors influencing perceptual development
  7. Describe briefly linquistic development
- B. Units of instruction
  1. Behavior genetics
     a. Heredity and variation
     b. Methods and findings of behavior genetics
  2. The development of the individual
     a. Stages of development
     b. Sensorimotor stage
     c. Symbolic operational stage
     d. Formal operations stage
  3. Perceptual development
     a. Communicating with infants
     b. Depth perception
     c. Perception of shape
     d. Perception and intelligence
     e. Perceptual modification
     f. Effects of early experience on humans
  4. Linguistic and cognitive development
     a. Thought, speech, and language
     b. Language and memory
     c. Language and cognitive development
     d. Linguistic relativity and development
     e. Psycholinguistics
  5. Problems of perception
     a. Patterns and objects
     b. Perception and prediction
     c. Gestalt psychology

d. Perceptual inferences
e. Perception of movement
f. Readjustment of perception
g. Applications of perception studies

III. Basic Processes of Behavior
A. Performance objectives
Upon completion the student should be able to:
1. Describe in writing the internal and environmental forces underlying behavior
2. Given a list of behavorial drives, identify as biological, psychological, or social
3. Compare and contrast primary with secondary motives
4. Explain briefly several theories of motivation
5. Explain briefly several theories of emotion
6. Define the concepts of personality
7. Analyze and describe the relationship of mental mechanisms to behavior
8. Given a list of various types of drugs, indicate the primary characteristic reactions to each

B. Units of Instruction
1. Fundamentals of motivation
a. Thirst
b. Hunger and the regulation of weight
c. Hunger, thirst, and temperature
d. Other homeostatic drives
e. Sexual behavior
f. Fear
g. Learned channeling
h. Curiosity
i. Aggression
2. Emotion and feeling
a. Perception and appraisal
b. Emotional reaction
c. Internal bodily changes
d. Secondary appraisal
e. Emotion and action
f. Personality
g. Personal adjustment
3. Drugs and behavior
a. Psychiatric drugs
b. Tranquilizers
c. Energizers
d. LSD

IV. Individual Differences
A. Performance objectives
Upon completion the student should be able to:
1. List several means of measuring individual differences
1. Describe the nature of intelligence and mental testing
3. Describe the statistics of influence
4. Explain the nature of creativity and the means of measuring it
5. Evaluate and interpret individual test scores by use of statistics
6. Describe the relationships of intelligence and time
7. Describe briefly the value and limitations of achievement tests

B. Units of Instruction
1. Measurement and methods
a. Psychological observations
b. Problems in observing
c. Measuring
d. Research designs
e. Statistical analyses
f. Findings, facts and theories
2. Individual differences and their measurement
a. Early studies
b. Characteristics of a test
c. Intelligence tests
d. Achievement and aptitude tests
e. Interest and personality tests
f. Significance of individual differences

V. Kinds and Nature of Learning
A. Performance objectives
Upon completion the student should be able to:
1. Identify and explain the steps in the learning process
2. Compare and contrast the various types of learning
3. Describe in writing various forms of reinforcement, discrimination, and imprinting
4. Describe briefly the relationship of sensory processes and learning
5. Define classical and operant conditioning
6. Describe how learning may be inferred
7. Describe briefly the principal learning theories
8. Compare and contrast classical and operant conditioning
9. Identify and describe factors which affect efficiency of acquisition

B. Units of instruction
1. Kinds and nature of learning

a. Learning and performance
b. Two basic kinds of learning
c. Motor skills
d. Problem solving
e. Incidental learning
f. Latent learning
g. Learning to learn

2. Operant conditioning
   a. Reinforcement and punishment
   b. Acquisition and shaping of behavior
   c. Extinction
   d. Stimulus control
3. Human learning and memory
   a. Remembering
   b. Organization of memory
   c. Learning
   d. Traditional studies of memory
   e. Forgetting
   f. The structure of storage
4. Problem solving
   a. Logic and thinking
   b. Characteristics of problem solving
   c. Problem difficulty
   d. Factors aiding problem solving
   e. Experience and problem solving
   f. Problem-soiving sets
   g. Originality and creativity
   h. Identification of concepts

VI. Human Relations

A. Performance objectives

Upon completion the student should be able to:

1. List the relationships that exist between an individual and the group
2. Describe the self-concept in relationship to the group
3. Identify the means by which society assists in shaping personality
4. Describe the major characteristics of group by name
5. List the several responses that an individual may elicit to overcome feelings of hostility and aggression
6. Describe the various types of leadership in relation to group structure
7. Describe briefly the problems of prejudicial personalities
8. Explain several theories of motivation
9. Define emotion and its relationship to motivation
10. Describe several problems of adjustment or reactions to adjustive demands
11. Explain the significance or role of communication as an essential human process
12. List and describe several consequences or effects on the individual that result from work dissatisfaction or conflict
13. Describe occupational role interaction
14. Describe several sources and responses to frustration

B. Units of instruction

1. Introduction to human relations
   a. The human relation concept
   b. The need for human relations
   c. The applied art and behavioral science of human relations
2. Ways of viewing man
   a. The problem of man's basic nature
   b. Psychological "models" of man
   c. Man as a living system
3. Healthy and faulty development
   a. Variations in development
   b. Early conditions conducive to faulty development
   c. Early conditions fostering healthy development
4. The problem of prejudice
   a. Preface
   b. Two cases
   c. Definition
   d. Is prejudice a value concept?
   e. Functional significance
   f. Attitudes and beliefs
   g. Acting out prejudices
5. Industrial development of human relations
   a. The development of human relations
   b. Fundamental concepts
   c. An integration of social sciences
6. Problems of adjustment
   a. Types and sources of stress
   b. Severity of stress
   c. Other key aspects of stress
7. Reactions to adjustive demands
   a. Introduction to adjustive behavior
   b. Processing adjustive demands
   c. Types of psychological adjustive reactions
8. Faulty patterns of adjustment
   a. Nature of effective and ineffective adjustment
   b. Major maladjustive patterns
   c. Introductive to treatment and prevention
9. Frustration
   a. Sources of frustration

b. Responses to frustration
c. The Scapegoat Theory
d. Weaving of psychodynamics

10. Aggression and hatred
    a. Nature of aggression
    b. The problem of "drainage"
    c. Social patterning of aggression
    d. The nature of hatred
11. The basic elements of human relations
    a. Individual needs
    b. Living together
    c. Group conflicts
    d. Leadership
    e. Background information
12. Communication processes
    a. The purpose of communication
    b. The anatomy of communication
    c. The art of listening
    d. Cybernetics
13. The individual in the group
    a. How groups develop and function
    b. Group-individual interaction
    c. Interpersonal relationship
    d. Ignorance and barriers to communication
    e. Size and density of minority groups
    f. Direct competition and realistic conflict
    g. Exploitative advantage
    h. Social regulation of aggression
    i. Cultural devices to insure loyalty
    j. Cultural pluralism vs. assimilation
14. The world of work
    a. Career choice: an opportunity and a problem
    b. Problems in occupational adjustment
    c. The future world of work
15. Emotional competence
    a. Components of emotional competence
    b. Dealing with problem emotions
16. Social competence
    a. Foundations of good interpersonal relationships
    b. Improving social competence

Texts and References

Allport. *The Nature of Prejudice.*
Coleman. *Psychology and Effective Behavior.*
Hilgard and Atkinson. *Introduction to Psychology.*

Related Media

McGraw-Hill Book Company, Textbook Film Department 327 W. 41st Street, New York, N.Y. 10036
Beginnings of Conscience, 15 min., 16 mm., Sd., B & W
Summary: Portrays the social forces that produce conscience.
Conflict, 18 min., 16 mm., Sd., B & W
Summary: Five basic types conflict are dramatized.
Perception, 17 min., 16 mm., Sd., B & W
Summary: Demonstrates the basic principles of perception.
Principles of Development, 17 min., 16 mm., Sd., B & W
Summary: Presents six basic principles of growth and change.

CRM Films, Dept. T. B., Delmar, Calif. 92014
Aspects of Behavior, 16 mm., Sd., Color
Summary: Basic introduction to psychology.
The Sensory World, 16 mm., Sd., Color
Summary: Animated presentation of senses and behavior.
Personality, 16 mm., Sd., Color
Summary: Analysis of personality of a college student.

MEDIA TYPING

Hours Per Week

Class, 1; Laboratory 2

Description

A basic course in typing to develop minimum clerical skills of 35 words per minute. This course is designed specifically to train educational media technicians in necessary typing skills. Upon developing basic typing skills, emphasis will be placed upon applied practice including business letters, report typing techniques, scripting formats, preparing spirit masters and stencils, offset duplicating masters, and typewriter composition for offset reproduction.

Laboratory time is devoted to skill development practice and may be conducted as individualized instructional format. Emphasis should be upon accuracy and procedures with minimum requirements of speed. In the applied laboratory exercises, efforts should be made to facilitate operation of duplicating equipment as a means of directly relating the exercises to the media field.

Consideration should be given to modifying the duplicating processes portion of Reprographics for students completing this course.

Major Divisions

	Hours	
	Class	Laboratory
I. Basic Typing Skills	7	12
II. Composition and Format	5	12
III. Duplicating Process	4	8
Total	16	32

I. Basic Typing Skills
- A. Performance objectives
  Upon completion the student should be able to:
  1. List and define the function of the primary operative parts of a typewriter
  2. Use the spacing and composing operative parts of the typewriter for correct layout and composition of material
  3. Perform normal or routine maintenance on a typewriter such as change ribbons, adjust tension, clean
  4. Type paragraphs at a minimum speed of 35 words per minute with no errors
- B. Units of instruction
  1. Operative parts of a typewriter
     a. Top segment
     b. Lower segment
     c. Additional or special parts
  2. Controls and mechanics of operation
     a. Electric typewriters
     b. Nonelectric typewriters
     c. Special controls
  3. Learning the keyboard
  4. Proper typing technique
  5. Building basic skills
     a. Paragraphs
     b. Figures
     c. Symbols
     d. Composition
- C. Laboratory
  Laboratory exercises in basic typing skills to build facility, technique, speed, and control

II. Composition and Format
- A. Performance objectives
  1. Type, with a minimum speed of 35 words per minute, and correct specified format, tabulations, letters, memorandums, basic business forms, manuscript or script copy
  2. Prepare typed master material for duplication including forms, announcements, and tables
- B. Units of instruction
  1. Problem skills
     a. Word division
     b. Registration and composition
     c. Business forms and styles
     d. Carbon copies
  2. Tabulation
     a. Vertical
     b. Horizontal
     c. Rulings
  3. Business letters
  4. Manuscripts and scripts

5. Technical papers and reports

C. Laboratory
1. Laboratory exercises in typing skill development
2. Laboratory exercises in typing tabulations, business letters, scripts, footnotes, and reports
3. Laboratory exercises in preparation of copy for duplication including forms, tabulations, rulings, announcements

III. Duplicating Processes

A. Performance objectives

Upon completion the student should be able to:
1. Prepare typed and typed-hand composition spirit masters
2. Prepare typed and typed-hand composition stencils
3. Prepare typed copy for direct-image masters for offset duplication
4. List and briefly describe common special-purpose typewriters

B. Units of instruction
1. Spirit duplication masters
   a. Spirit masters
   b. Typing on masters
   c. Correcting masters
   d. Colored masters
   e. Heat process master preparation
2. Operating the spirit duplicator
3. Mimeograph stencils
   a. Stencil makeup
   b. Types of stencils
   c. Guidelines on stencils
   d. Layout and composition
   e. Typing on stencils
   f. Correcting mistakes
   g. Writing on stencils
4. Operating the mimeograph
   a. Normal runs
   b. Special-size papers
   c. Changing inks and colors
5. Direct-image offset masters
   a. Direct-image masters
   b. Preparing the typewriter
   b. Preparing the typewriter
   c. Guidemarks and composition
   d. Typing on direct-image masters
   e. Error correction
6. Operating the tabletop offset press
7. Specially designed typewriters for composition and direct-image assembly

C. Laboratory
1. Laboratory practice in preparation of masters and short-run copy

Text and References

Lessenberry, Wanous, Duncan. *College Typewriting.*

Related Media

A. B. Dick Company, 5700 Touhy Avenue, Chicago, Ill. 60048

Techniques of Modern Fluid Duplicating, 35 mm., filmstrip, Sd., reel or cassette tape.

Techniques of Modern Mimeographing, 35 mm., filmstrip, Sd., color, reel or cassette tape.

Summary: Programmed filmstrips and guides presenting the principles and techniques of spirit and mimeo duplicating.

A. B. Dick Graphic Communication Series.

MEDIA SEMINAR

Hours Per Week
Class, 16

Course Description

This seminar discusses the media field and opportunities for graduates within the field. Techniques and procedures for employment application are explored, including preparation of resumes, letters of application, and development of portfolios, together with simulated experience with interviewing and personnel or job relations. Effective, accurate communications and a thorough understanding of the curriculum and media field are imperative to seeking employment. The course structure should provide maximum individual experience through simulation and critique to develop confidence and insure preparation for interviewing.

The content of this course is considered increasingly important but may be presented as a single objective seminar or as an integral part of other seminars or courses.

Major Divisions

	Hours Class
I. The Media Field and Employment Opportunities for Instructional Media Technicians	2
II. Preparation of Resumes	2
III. Preparation of Letters of Application	3
IV. Portfolio Techniques	3
V. Interviewing and Interviewing Techniques	4
VI. Personnel Policies — Job Relations	2
Total	16

I. The Media Field and Employment Opportunities for Instructional Media Technicians
- A. Performance Objectives
  Upon completion the student should be able to:
  1. List and describe the functions of media technicians in educational, institutional, agency and industrial organizations
  2. Describe and distinguish between the tasks and responsibilities of personally comprising an instructional media center
- B. Units of instruction
  1. Functions of instructional media technicians
  2. Employment opportunities in:
     - a. Educational institutions
       - (1) Elementary and secondary schools
       - (2) Post-secondary institutions
       - (3) Other educational institutions
     - b. Industrial organizations
       - (1) Related media industries
         - (a) Equipment manufacturers
         - (b) Distributors
         - (c) Sales
       - (2) Nonrelated industries
         - (a) In-house training
         - (b) Advertising
         - (c) Literature
         - (d) Sales
     - c. Government agencies
     - d. Government agencies
     - d. Commercial fields
       - (1) Advertising
       - (2) Businesses
       - (3) Public
     - e. Specialization or general service

II. Preparation of Resumes
- A. Performance objectives
  Upon completion the student should be able to:
  1. State the general uses of resumes or data sheets
  2. Describe the common formats of resumes or data sheets
  3. Complete an analysis of individual job objectives in relation to background qualifications and experience
  4. List and describe the elements and relationships of the curriculum in regard to skills, course content, and limitations
  5. Prepare and reproduce a personal data sheet or resume
  6. Discuss the curriculum elements in relation to specific positions or job situations
- B. Units of instruction
  1. Analyzing job objectives
  2. Analyzing qualifications

a. Academic
b. Experience

3. Purpose and content of resumes
   a. Introduction
   b. Education
   c. Experience
   d. Personal data
   e. References
   f. Types of formats
   g. Reproduction of resumes

III. Preparation of Letters of Application

A. Performance objectives

Upon completion the student should be able to:

1. Prepare effective letters of application for various employment situations
2. Prepare employment followup or response correspondence

B. Units of instruction

1. Purpose of letters of application
   a. Transmit
   b. Sell
2. Content of letters
   a. Introduction
   b. Selling message
   c. Closing
3. Letter forms and styles
   a. Grammar, spelling, style
4. Other employment letters
   a. Interview acceptance
   b. Position acceptance
   c. Position refusal
   d. Time extension

IV. Portfolio Techniques

A. Performance objectives

Upon completion the student should be able to:

1. Develop an effective portfolio of media and materials
2. Discuss and describe in terms of objectives, procedures, techniques of preparation material in the individual portfolio
3. Present the portfolio to individuals or small groups

B. Units of instruction

1. Analyzing the portfolio
2. Organizing portfolio
3. Methods of display of materials
4. Portfolio presentation
5. Practice in portfolio presentation

V. Interviewing and Interviewing Techniques

A. Performance objectives

Upon completion the student should be able to:

1. List the steps in preparation for an interview
2. Respond to typical questions of interviews
3. Conduct by simulation and role-playing interviews

B. Units of instruction

1. Preparation for interviewing
2. Review of typical questions
3. Do's and don'ts of interviewing
4. Simulated interview situations

VI. Personnel Policies — Job Relations

A. Performance objectives

Upon completion the student should be able to:

1. List and briefly describe typical benefit considerations and policies in various types of organizations
2. Describe and discuss typical employer-employee relationships through analysis by case study

B. Units of instruction

1. Employee-employer relations
   a. Unionization
2. Types of positions
   a. Hourly
   b. Monthly
   c. Salaried
3. Fringe benefits
4. Obligations and responsibilities to the employer
5. Employment longevity
   a. Upgrading
   b. Updating
   c. Changing jobs

Texts and References

Arco Publishing Company. *Resumes that Get Jobs.*
Menning. *Writing Business Letters.*

Related Media

Churchill Films, 622 N. Robertson, Los Angeles, Calif.
Job Interview, 2 films, S-8, Sd, Color
Summary: Techniques and do's and dont's of interviewing.

Coronet Films, 65 E. South Water Street, Chicago, Ill.
Your Job, Super 8, Color

Guidance Associates, Pleasantville, N. Y., 10570
Job Hunting, Where To Begin, Sound filmstrip.
Your Job Interview, Sound filmstrip.
Getting and Keeping Your First Job, Sound filmstrip, 35 mm., Sd., Color, Records or cassette tape.
Summary: Vocational guidance series related to job hunting, interviewing and job performance.

Boston University Film Library, School of Education, 765 Commonwealth Avenue, Boston, Mass., 02215

Interview. 5 min., 16 mm., sd., color.

Summary: Humorous cartoon visualizing an interview with a jazz musician who speaks the "Beatnik" vocabulary and whose conversation is something less than clear.

Laboratories, related classrooms, offices, and storage spaces required for teaching an educational media technician program do require somewhat special conditions but such conditions can easily be developed in any well-constructed building possessing such services as water, heat, light, ventilation, plumbing, electrical services, and other adequacies such as good entrances, hallways, fire exits, toilets.

Multistory buildings can be satisfactorily used to house the educational media program providing its mechanical arrangements are satisfactory (hallways, stairways, etc.) and will meet standards of safety for students and staff in communications, interbuilding traffic, fire protection, etc. Adequate washroom facilities must be provided for both male and female use. In multistory buildings, duplicate facilities should be located on each floor. Janitorial services and storage areas must be located on each level in a multilevel building and at appropriate locations in a single-story arrangement.

It is common practice to locate storage areas near the television studio and other laboratories where recording is being conducted. Storage rooms generally are not a source of noise and offer sound protection to areas requiring a minimum of outside noise interference.

Natural lighting is not a necessary requirement for any of these facilities. However, both classrooms and laboratories should be well lighted. It is suggested a minimum of 70 foot-candles of light be provided on all work surfaces in classrooms, offices, and laboratories. In all rooms where drafting is to be done or where fine handwork is required, a minimum of 100 foot-candles of light, exclusive of natural light, should be provided.

Lighting fixtures should be selected to provide a comfortable, uniform light throughout the room; usually fluorescent-type light is the most satisfactory. Lighting fixtures should be arranged diagonally to the tables in design rooms. This arrangement of lighting prevents drawing equipment shadows from appearing on the drawing surface.

Mechanical equipment which provides constant temperature and humidity control within drafting rooms is very desirable. Air in these areas should be within comfortable temperature and humidity ranges and should be circulated with sufficient amounts of outside air to keep air in rooms suitably fresh. In warm climates, year-round air conditioning is recommended.

Faculty offices may best be placed in small clusters near classrooms and laboratories. No more than two faculty members should be placed in each office, but several offices can be combined with an outer office for a secretary or receptionist so that several instructors may share secretarial service. As in design rooms, movie and television studios, air conditioning (in warm climates) is desirable. Each faculty member should have a minimum of 150 square feet of office space.

Many of the laboratories such as photography and television studios and printing and photography darkrooms must have air conditioning together with exceptionally good ventilation. In these studios the need for much better lighting presents a heat problem not usual to most laboratories. A minimum of 12 feet of free ceiling height (below lights) is recommended for studio areas for lighting and heat control.

Photographic darkroom, processing, and finishing areas require unusual water and plumbing facilities. Adequate source of pressure-stabilized, temperature-controlled (to 1/2° F.) water supply is necessary and plumbing drainage system must be compatible with photographic chemicals. These requirements also apply to the printing darkroom facilities.

Laboratories containing moving equipment which might not only be too heavy but noisy should be located as far away as possible from studios where recording is being done. An example of a noisy area is the printing laboratories.

The electrical services in some laboratories will be exceptionally great and consideration should be given to providing three-phase four-wire service to such an area. This service will provide for 110/220 volt service as well as providing an easy method of balancing live loads. In many laboratories it will be desirable to have a single electrical control point where an electrical service can be controlled.

Areas such as the television and filmmaking studios, media equipment, and printing, platemaking, involve such high electrical requirements. Consideration in both new and existing facilities

for adequate distribution is necessary.

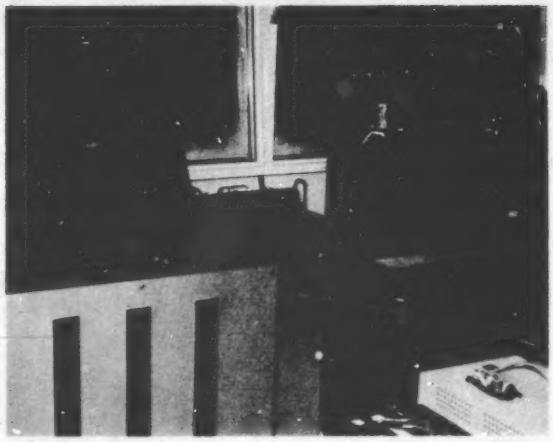

Figure 9—Many institutions rely heavily upon instructional television and distribute both live programs and video tapes.

Classroom and lecture demonstration areas should be equipped for multimedia presentations and for autotutorial or independent study. All instructional facilities must be planned to enable maximum exposure to mediated instruction.

Much of the equipment and supplies for the program present unusual security and storage problems. Ample storage and distribution space, conveniently located in relation to the facility, is necessary for efficiency and control.

If plans are being made to start an educational media program in an institution already offering programs in the technologies, a careful analysis should be made of existing classrooms and laboratories to determine the feasibility of using them. Some of the space provisions might not have to be duplicated since minor adjustment in their physical plan may make them suitable for this program. This discussion assumes the conventional classrooms, offices, and lecture rooms contain the necessary facilities to be effective areas, and that potential laboratory spaces may be readily modified to satisfy the unique utility requirements. The primary factors of consideration would be:

1. Electrical distribution
2. Lighting and lighting control
3. Noise and acoustics
4. Water supply and plumbing
5. Air conditioning and/or ventilation
6. Ceiling heights
7. Architectural features such as doors, windows, construction, traffic
8. Storage and security

For the purpose of this discussion, only the facilities specifically identifiable with the technical specialty are described. It is assumed that classrooms, offices, lecture rooms, and the necessary related facilities are available for teaching nonlaboratory courses. It is also assumed that there is a suitable laboratory for teaching media physics since the classrooms, laboratory facilities, and laboratory equipment required to teach the physics courses are conventional and the details need not be presented here. However, the requirements for the technical specialty courses are unique and therefore the minimum facilities and equipment required are presented in some detail.

A unit of class size of 16 students per section has been used as a base of laboratory — facilities — supplies recommendations. The necessity for individualized instruction in skill-oriented laboratories together with multiple-concurrent laboratory activities limits section size. Lecture courses or lecture sections of combined lecture-laboratory courses easily combine to 32, 48, 64 per section.

Careful evaluation of facility utilization and commonality of spaces readily enables combining laboratory areas to minimize necessary facilities. The suggested laboratories allow flexibility of scheduling and student availability of facilities. However, course areas such as educational media techniques, graphics design, and technical illustration and reprographics might be combined due to related functions. Photographic studio space would be available through use of the television studio. A specific film studio would enable greater scheduling flexibility but such studio productions could readily be accomplished by use of the television studio area. In this manner, minimum dedicated laboratory space could suffice to support the program operation.

EDUCATIONAL MEDIA TECHNIQUES LABORATORY

Facilities for preparation and processing of overhead transparency and display media are provided in this laboratory (see Appendix D). Small drawing tables (24 by 30 inch) provide the necessary work surface for layout. Cutting boards, readily prepared from hardboard, are necessary to protect the drawing surface. Parallel bars are not recommended as they are frequently abused by use as a cutting guide.

The front or lecture wall and side wall should

provide ample display area including cork, flannel, and magnetic. Multiple overhead projection screens are recommended for student projection of prepared visuals. Drafting room lighting is necessary for the design area providing a level of 100 foot-candles at table level. Wall outlets of 20-30 ampere service should be provided at 3-to 4- foot intervals around the laboratory and at work area. The darkroom and processing areas should be air conditioned and ventilated at a rate of 10 air changes per hour. Rotary or drum-type light locks provide space economics but should be evaluated in relation to state and local codes. The darkroom area should be safely lighted for orthofilm and/or panfilm.

DESIGN AND GRAPHICS—TECHNICAL ILLUSTRATION LABORATORY

The principal demand of the design and graphics or technical illustration area is drawing table surface (see Appendix E). These tables may be small, providing 24- by 30- inch or 42- inch surface. Each table should be equipped with a parallel bar. Removable drafting machines provide a convenient and professional experience but are not required. The area is divided into an instructional and working area to facilitate graphics preparation for other course areas. Lighting should provide a shadowless level of 100 foot-candles at table level. Natural light from a north wall is desirable but not necessary and all window areas should be provided with shades for projection.

Airbrush stations should be equipped with a nonporous, cleanable surface and exhausted with a low velocity exhaust hood. If facilities of the educational media techniques laboratory are not conveniently available, the area should include equipment for waxing, composition photographic copy stands, and projection. In the working graphics design area, space above the drafting tables could provide for display and drafting tool storage.

PHOTOGRAPHIC LABORATORY

The photographic laboratory enables students to work on any part of the photographic process at one time (see Appendix F). Entrance to the printing darkroom through light locks allows simultaneous use of copy preparation equipment, print finishing, and printing. Individual darkrooms provide for film processing. Consideration should be given to machine developing in the print room and fixing in the finishing area. The laboratory is equipped for black-and-white film processing and printing. Color reversal film processing may be accomplished in the film darkrooms. Although color printing capabilities are not included, the addition of color enlarging equipment and drum processors to the darkrooms readily expand the facility to this capability.

Although water temperature and pressure regulation is not required for black-and-white processing, it is recommended that all sinks be equipped with regulators. Air conditioning and a ventilation rate of 10 air changes per hour is necessary in this area.

Figure 10—Experience with various camera types and both on location and basic studio photography is an important part of an Educational Media Technicians program.

All safe lights should be on separate circuits on key-type switches. Equipment with high electrical requirements such as film and print drying should be on separate electrical circuits. The addition of color printing equipment will require voltage stabilization for each darkroom and such regulation should be considered for the gang printing area.

REPROGRAPHICS LABORATORY

The reprographics laboratory provides the capability of instruction in all basic aspects of graphic communications up to multiple-color offset printing (see Appendix G). The laboratory is equipped as a minimal facility but this space is adequate for expansion as program growth and need for equipment sophistication arises. Adequate floor space is provided around equipment to limit traffic flow near equipment and still provide a fast, smooth flow of work. Work areas also provide from group instruction in operating techniques. Process areas are separated to facilitate

simultaneous activities.

Most of the equipment will require 115 volt service but items such as larger presses, power papercutter, process cameras will require 220 volts. Presses will need either floor-mounted or overhead outlets. Other than the darkroom area which requires safe lights, the floor area lighting should be 150-200 foot-candles. The stripping area should have individual lights over each table.

Ventilation for the darkroom area should provide approximately 10 air changes per hour and be exhausted directly out. The press area should have an air change rate of 1-1/2 to 2 times normal. Other areas require only normal instructional area ventilation.

Each of the primary areas allow for facility expansion by the addition of more sophisticated or larger equipment or additional equipment such as added presses, light tables, composition equipment. The darkroom facilities will accommodate larger press facilities than indicated.

MEDIA EQUIPMENT OPERATION AND MAINTENANCE LABORATORY

This laboratory area provides facility for setup, operation, repair, utilization of equipment and storage, distribution, repair of software (see Appendix H). Both group lecture demonstration instruction and individualized instruction are available with provisions for multiple student activities. Electrical test benches provide suitable tool work surface and should be provided with an air supply of 30 psig. This lecture demonstration table should be equipped with power, air vacuum cleaner, video, and R F signals. If the facility allows, conduit run between the lecture demonstration table to the test benches and study carrels provides extensive capabilities in operation of distribution or access systems. A rear screen projection system can be provided through use of the adjacent storage area to contain the projection equipment. Individual student laboratory stations should have provisions for use of independent study materials.

Electrical services for the test benches should be 20-30 ampere and adequate outlets should be provided at 3 to 4-foot intervals around the room. Light control for projection is necessary and various projection distances can be obtained by careful location of screens and projection stands.

FILM LABORATORY

Use of the television studio area for studio film production limits the need for a specific laboratory for this purpose. The basic requirements of such a facility would be similar to the nonochrome facility with the 20- by 30-foot dimensions providing adequate distance for full image shooting. Audio facilities of the control and studio areas would facilitate production of both silent and sound films. The additional space necessary for editing, titling, animation, and projection would be readily available in the techniques or equipment areas.

EDUCATIONAL TELEVISION LABORATORY

The primary consideration in television studio facilities is that of color vs. monochrome and the associated economics (see Appendix I). All present indications are that most, if not all, television equipment will be color in a few short years. Production techniques do not differ basically from monochrome to color and an initial facility might be for monochrome. However, it is highly recommended that color or color capability be considered.

The basic studio of 20 by 30 feet would be adequate for either monochrome or color but would hamper the range of potential of the program. Minimum free ceiling height of 1w feet is necessary for lighting and lighting control. Ceiling grids of light connector strips with twist lock connectors should be located with a pipe grid for hanging lights. Each wall should have a minimum of one outlet box. Entrance to the studio should be by double 48-inch doors to allow free movement of equipment or props. The control room of a 20- by 50-foot studio could be on end wall or side wall. Consideration should be given to entrance to the control room for ease of moving equipment into the area and for acoustical treatment of the area. It is desirable to fully air condition the studio and control room and necessary to consider air conditioning for the control room. Careful attention is needed to minimize mechanical equipment and air distribution noise as well as sound carryover by the air-conditioning equipment. Power requirements of the facility, including lighting and equipment, will be 50-100 amperes. A minimum of 150-ampere-serivce is recommended.

For color capability and program flexibility, a 30- by 50-foot studio with 20- by 10- foot control room is desirable. A larger studio would accommodate two setups simultaneously. In either studio area, visual connection between studio and control room is not necessary but desirable for an instructional supervision.

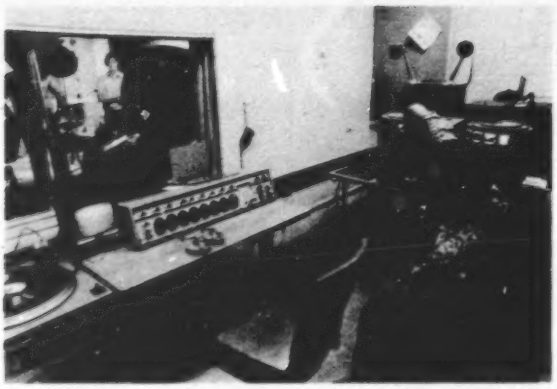

Figure 11—Operation of instructional television studio control equipment including switches, special-effects, audio and film chain equipment enables the Educational Media Technician to assist with the production of video tapes.

ESTIMATES FOR SPECIFIC LABORATORIES

The initial costs of equipping and supplying the educational media technology facilities is extensive. Therefore, the accompanying lists reflect minimum costs yet each space provides flexibility in instructional use and allows for convenient expansion as funds and program growth develop. Both the equipment and supplies casts are based on 1972-73 prices.

Quantities of equipment and supplies are based upon a 16-student unit. Supplies listed encompass expandable and non-expendable items, so their estimated total costs reflects an initial cost and will be lower for subsequent student units.

Recommended student-purchased supplies may be expanded to reduce school-incurred costs or may be eliminated. Many supplies are impractical for student purchase, such as film, chemicals, offset plates, due to storage problems and high cost of small-quantity purchases.

Considerable savings in initial costs are possible through combining laboratory areas. Suggestions that would result in limited loss of flexibility would be the following:

a. Combine educational media techniques with the design and graphics-technical illustration areas, reducing the drafting table requirements and eliminating the working graphics area.
b. Utilize the process camera of the reprographics laboratory darkroom for plate and transparency preparation.
c. Utilize the facilities of the design and graphics laboratory for all layout and composition.
d. Combine the media equipment laboratory within the media techniques areas.

EDUCATIONAL MEDIA TECHNIQUES LABORATORY

Equipment

Item	Number Required
Drawing tables, 3' x 4' wood, adjustable	18
Signmaker kit	2
Portable overhead projector	1
Hot laminator	1
Cold laminating machine	1
Lettering machine (headliner)	1
Fonts	10
Matte projection screens	
48" x 64"	1
54" x 72"	1
Papercutter, 24" x 24"	2
Dry mount press	
18-1/2" x 23"	1
12" x 15"	1
Taking iron	2
Dry photocopier	1
Thermocopy machine	1
Waxer	1
High-speed diazo machine	1
Opaque projector	1
Slide projector with filmstrip adaptor	1
Stack loader	1
Bulletin (primary) typewriter	1
Visual maker, 2' x 2'	1
Transparency stapler	2
Strip printer	1
Fonts	10
Light tables	12
Photo modifier	1
Timer (Crolok)	1
Wall-mounted squeegee, 18"	1
Projection cart, 16"	1
Projection cart, 26"	2
Darkroom sink	6
Darkroom trays	6
Sink siphon	1
Drafting chairs	24
Fonts	
1/4" Gothic	1
1/4" Slant	1
3/8" Gothic	1
3/8" Slant	1
1/2" Gothic	1
1/2" Slant	1

Supplies

Item	Number Required
Lettering pens	4
Scriber and guides	2
Spare projection lamp	1
Laminating tissue 12" wide, roll	1
Laminating Tissue 8-1/2" x 11", 1,000 sheets	1
Film, headliner	10
Paper, headliner	5
Chemicals, headliner	1 gal.
Flannel boards	3
Bulletin boards, 1 sq. yard per 3 students	8
Mounting tissue, 500 sheets, 11" x 14"	1 box
Laminating tissue, 11-1/8" x 100	1 roll
Cloth backing material, 11" x 14", 100 sheets	1 box
Copy paper, 200	1 box
Transparency making material, 200	1 box
Copy paper, 500 sheets	1 box
Transparency material, 500 sheets	1 box
Thermo spirit masters, 100	1 box
Adhesive wax	1 pkg.
Diazo film, 300 sheets	3 boxes
Anhydrous ammonia	1
Slide tray, slide projector	10
Pantograph	2
Staples	1 box
Film, strip printer	5
Developer, strip printer	2
Litho film 8" x 10", 50 sheets, photo modifier	2 pkgs.
Litho developer, 5 gal. photo modifier	1
Stop bath, 1 gal. photo modifier	1
Fixer, 1 gal. photo modifier	1
32 oz. graduate, photo modifier	1
Process thermometer, photo modifier	1

Item	Number Required
Flashing lamp, photo modifier	1
00 filter — 5-1/2D, photo modifier	1
Hand squeegee, photo modifier	1
Proportion scale	1
Clear acetate, 1,000 sheets	1
Frosted acetate	100
Hinges for transparencies	2 boxes

Student Purchased Supplies

India ink	Mending tape
Flannel for flannel boards	Wax pencils
Construction paper	Marking pens
Thumbtacks	Masking tape
Size 126 color reversal film	Triangles
Flashcubes	Pencils
Iillustration and mount board	Erasers
Overhead transparency mounts	Speedball pen kit
Container of fixing spray	Cutting knife
Opaque tape	French curve
Color transparent transfer tape	Scissors
Transfer colors	Rubber cement
Transfer patterns	Tracing paper

Estimated cost per student $30 to $40

DESIGN AND GRAPHICS — TECHNICAL ILLUSTRATION LABORATORIES

Equipment

Item	Number Required
Drafting tables, 42"	24
Drafting stools	32
Drawing storage cabinet with wall cabinet	15 ft.
Classroom drafting tables	8
Swivel chairs	10
Parallel straight edge, 42"	24
Viking drafting machines, 31" x 42"	8
Perspective drawing devices	8
Perspective indicator sheets	8
Double-frame, double-page pasteup light table	4
Papercutter, 36"	4
Dry mount press, 18-1/2" x 23"	2
Airbrushes, sets and hoses	10
Headliner or photo-composing machine	1
Waxer	1
Copy stand with lights 35 mm. SLR camera, macrolens	2
Proportioning dividers	6
Beam compass, — 12"	4
Perspective drawing boards	6
Irregular curves	4 sets
Snips curves	4 sets
Adjustable triangles	6
Lettering sets	6
Reservoir pens, template assortment	12
Isometric drafter	2
Pencil pointers and sharpeners	3
Pin-registration boards, punches	12

Supplies

Item	Number Required
Illustration board, — 15" x 20"	100
Copy - clip set	1
Draftsman/s brushes	12
Transfer letters and symbols, — assortment	
Shading film and pattern Films, assortment	
Color reversal film	20
High-contrast or litho film — 100 ft. rolls	2
Specialized drafting or section paper — Nonreproducible and reproducible	

Student Purchased Supplies

Item	Number Required
15" x 20" Illustration Boards	20
30° 60° Triangle	1
45° Triangle	1
Paints tempera, oz. red yellow blue white black	2
12" Steel ruler	1
Speedball penpoints C-4 C-D B-4 B-D	4

Item	Number Required
Penpoint holder	1
India ink, black	1 bottle
Proportional scale	1
No. 2 Mars pen	1
Drafting tape	1
No. 3 Paintbrush	1
No. 2H and 4H pencil	1
Architect's scale	1
French curve	1
Drafting instruments	1
Stencil knife set	2
Transfer letters	2 sheets
Shading films	2 sheets
Cel acetate	24 sheets

Estimate cost per student $30 to $35

MEDIA EQUIPMENT AND MAINTENANCE LABORATORY

Equipment

Item	Number Required
Audio Equipment	
Reel-to-reel recorders, stereo and monophonic	4
Cassette recorders	4
Earphones	10
Audio mixer, 3 channel	2
Microphones from TV	2
4-channel listening center	2
Monophonic phonographs transcription player P.A. system	1
Auxiliary speakers (4", 8")	6
Tape, cassette, record — care, — service	
Tape splicing block	2
Bulk tape erasers	1
Player-recorder head demagnetizer	1
Cassette eraser	1
Screens	
Matte 6' x 8'	1
Beaded 6' x 8'	1
Lenticular	1
Aluminum foil	1
Rear screen plaxiglass	1
Overhead, matte	1
Tabletop — rear projection screens	6
Projectors	
16 mm. Motion picture with manual threading, phone input, auxiliary speakers, accessory lenses	2
Super 8 projectors, magnetic sound	2
Cartridge projectors, sound	2
Cartridge projectors, silent	2
Overhead projectors	3
Slide projectors, tray	4
Slide projectors, stack loading	1
Dissolve control	1
Audio synchronizer	2
Stack loaders	2
Sound filmstrip projectors, remote control	2
Filmstrip projectors, record player	1
Combination — slide-filmstrip projector	1
Opaque projector	1
Film, Slide-editing Previewing Care Equipment	
16 mm. editors, viewers and rewind	2
8 mm. editors, viewers and rewind	2
16 mm. splice blocks	2
8 mm. splice blocks	4
35 mm. splice blocks	2
Filmstrip previewers	2
Slide light tables	4
Tacking irons	4
Double te. t bench with tunnels and supply	6
Study carrels	8
Counter with storage-base cabinet, 20'	1
Wall hung cabinet, 20'	1
Chalkboard, 4' x 8'	1
Display board, 4' x 8'	2
Magnetic, chalk and display, 4' x 8'	1
Stools with backs and seats	12
Fixed seating with tabletop	12
Lecture demonstration table 3' x 6' x 3' high	1
Filmstrip cartridge, cassette, film storage cabinet	2
Equipment storage cabinet, metal, 28" deep	1
Small parts cabinet, drawered, metal	1

SIX STATIONS

Item	Number Required
Extension lamps	6
Pencil soldering iron	6
Wire cutters and strippers	6
Diagonal side cutters	6
Long-nose pliers	6
Screwdrivers	
3/32"	6
1/8"	6
3/16"	6
Phillips	6
Adjustable wrenches	6

Supplies

Item	Number Required
Nut driver sets	
3/16" to 1/2" and nut starter	6
Rolls — resin core solder	6
Heat sinks	6
Knife sets	6
Soldering pads	6
Stubby screwdrivers	6
Soldering gun	6
VOM	6
Tube tester	1
Amprobe	6
VTVM	6
Phone plugs	6
Alligator clips	6
Cassette tape splicer	6
Splicing block	6
Cassette tape eraser	6
Tape editing winders plus splicer	6
Leader tapes	1
Tape head demagnetizer	1
Videotape splicer	2
Tapehead cleaner	1
Audio amplifiers, 4 watt	6
8 ohm speakers	6
4 ohm speakers	12
Zinc carbon batteries	6
Shielded microphone cable, 100'	1
Wire, No. 20, No. 18, 500'	1

Equipment

Item	Number Required
3-conductor cord, 500'	1
Battery chargers	3
Lugs, nuts, fasteners, screws, terminals plugs, wire nuts	Assort.
Tube sockets	Assort.
Patch cord connectors	6
Audio connector cables	6
Coaxial connectors	6

Conduit run from lecture demonstration to benches, benches to carrels. Provisions for light control in room, off, and dimmer.

Lecture demonstration equipped with a.c. power, d.c. supply, Air — R.C., video signal jacks.

EDUCATIONAL TELEVISION TECHNIQUES — MINIMUM FACILITIES, MONOCHROME

Equipment

Item	Number Required
Studio lighting, 20' x 30'	1
Slide projector	1
16 mm. film projector	1
Speakers, total	1
Equipment, cabinetry, total	1
Videotape recorders	2
Film chain multiplexer	1
TV camera kits and viewfinder	2
Audio-video modulator	1
Distribution equipment	1
Synchronization generator	1
Switching equipment	1
Studio monitor	1
Control room monitors	5
Turntable	1
Tape recorder	1
Audio mixer	1
Remote television gear, complete	2
Microphones and stands	1
Super 8 movie projector for film chain	1
Studio to control room talk back system	1
Videotape, 1/2" variety, 10-30 min., 10-60 min	1
Studio drapes and/or cyclorama	1
Studio lighting, 30' x 50' total	1
Total equipment for color, total	1
Cable connectors for color, total	1

Item	Number Required
Slide projector	1
16 mm. film projector	1
Pedestal and cradle head	2
Speakers, total	1
Cabinetry, total	1
Videotape recorders	2
Film chain multiplexer	1
Vectorscope	1
Color cameras, studio and film chain	3
Audio-video modulator	1
Color distribution equipment	1
Synchronization generator	1
Special-effects generator	1
Studio monitor	1
Control room monitors	5
Tape cartridge unit	1
Turntable and related parts	1
Stereo tape recorder	1
Audio control board	1
Assortment of studio microphones and related equipment (7 microphones)	1
Super 8 mm. projector for television	1
Control to studio talk back system, 8 stations	1
Studio drapes and/or cyclorama	1
Videotape, 1" 10-60 min., 10-30 min	1

PHOTOGRAPHY LABORATORY

Equipment

Item	Number Required
35 mm. SLR cameras with 3.5 macrolens	8
Polarizing filters	4
Cameras, 2-1/4" x 2-1/4"	8
Tripods	12
Copy stand/lights	4
Flim clips	16
Film drying cabinet	1
Developing tank with two 35 mm. reels per tank	8
120 reels	8
Photo thermometer	6
Graylab 300 timers	7
One-pint bottles	36
One-gallon bottles	14
Storage tanks, 7 gall	3
Sinks without stand, 22" x 36" x 5"	5
Film openers 35 mm	4
Temperature control valve	5
Chemical mixer, 5 gall	1
Sink, 29" x 72" x 8"	3
Dry mounting press, 18-1/2" x 23"	1
Print trimmer, 24"	1
Print dryer	1
Print washer	1
Slide duplicating and processing units	2
Slide mounter	1
Light table, 19" x 25"	1
Enlargers with 50 mm. lens and 75 mm. lens	10
Time-O-Lite M 59 timers	10
Four-way easels	10
Sets polycontrast filters	10
Trays, 11" x 14" x 5"	3
Photo trays, 8" x 10"	18
Kodak utility safelights with 10" x 12" filter (OC)	6
Refrigerator-freezer with lock	1
Large cabinet for camera storage	1
Shutter release, 12"	10
Electronic flash unit	8
Graduates, 16 oz	12
Set bellows with slide copy units, 35 mm. cameras	2
Copy tube	2

Supplies

Item	Number Required
Gallons film developer (Kodak D-76)	48
Gallons paper developer (Dektol)	40
Gallons fixer	70
Gallons indicator stop bath (Kodak)	4
Pints Kodak Photo Flo 200	5
Gallons hypo-clearing agent	25
Color reversal film processing kits	16
Enlarging lamps	10
3200° K lamps	16

1.30

Item	Number Required
Rolls Plus-X film	36
Rolls color reversal film	36
Rolls Tri-X film	36

Student Purchased Supplies

Item	Number Required
Rolls Plus-X film PX 135-20	6
Box (100 sheets) polycontrast paper 8" x 10" SWF	1
Rolls Tri-X film TX 135-20	2
Rolls high-speed ektachrome EHB 135-20	4
11 x 14 mount board	10
Pack dry mount tissue	1

Estimated cost per student $30

REPROGRAPHICS LABORATORY

Equipment

Item	Number Required
Process camera, 18" x 22", horizontal	1
Developing sink, built-in viewing, washing area	1
Developing trays, 14" x 18"	3
Film cabinet with trimmer	1
Safelights, fluorescent	3
Safelights, screw in	2
Inspection light	1
Cabinet, work surface and storage	1
Composition area	
Photo compositor, manual, daylight	1
Typewriters, electric	2
Waxer	1
Lineup table	1
Paper and supply storage area	
Steel shelving, paper and supply storage unit	1
Refrigerator	1
Stripping and platemaking area	
Light tables, double work surface	3
Platemaker	1
Plate sink	1
Plate storage cabinet	1
Hand-washing sink, half round, foot control	1
Bindery area	
Paper jogger	1
Wire stitcher	1
Papercutter, hydraulic	1
Mechanical binder	1
Padding press	1
Paper folder	1
Collator	1
Paper drill	1
Press Area	
Stencil duplicator, electric	1
Fluid duplicator, electric	1
Offset presses, 10" x 15"	3
Electrostatic master maker	1
Paper carts	1

Supplies

Item	Number Required
Press Area	
Reams mimeograph paper	12
Quire assorted mimeograph stencils	10
Pounds mimeograph ink	5
Ink pads	12
Protective covers	4
Blockout	2 pkgs.
Typer's plate	20
Writer's plate	10
Signature plate	20
Correction fluid (bottles)	2
Bottles correction cement	2
Assorted styli (2 each)	12
Assorted letter guides	12
Reams spirit duplicator paper	12
Spirit masters	100
Color carbon sheets	100
Gallon spirit duplicator fluid	1
Dozen correction pencils	1
Direct-image offset masters	250
Presensitized aluminum plates	250
Dozen reproducing pencils	1
Dozen nonreproducing pencils	1
Dozen reproducing pens	1
Dozen wedge erasers	1

Item	Number Required
Dozen erasers with brushes	1
Bottles drawing fluid	12
Cartridges black offset ink	6
Cartridges assorted color inks	6
Process ink, yellow, magenta, cyan	1 each
Pounds white ink	2
Pounds ink drier	1
Pounds ink varnish	1
Ink-dispensing guns	3
Gallon etch	1
Gallons fountain concentrate	2
Gallon gum	1
Gallons blanket wash	5
Blanket wash dispensing cans	3
Cleanup mats	500
Pint chrome cylinder cleaner	1
Pint glaze remover	1
Hand cleaner	1/2 gal.
Hand cleaner dispenser	1
Offset blankets	3
Can blanket powder	1
Rolls electrostatic masters	10
Rolls electrostatic copy paper	5
Quarts electrostatic toner	12
Quarts electrostatic conversion solution	6
Packs cotton pads	50
Cotton pad dispenser	4
Pounds rags	100
Reams offset paper	120
Composition area	
Photo composition type masters	6
Rolls film paper for photo composition	12
Gallons developer for photo composition	2
Gallons fixer for photo composition	2
Typewriter ribbons	6
Tack wax for waxer	2 lbs.
Bindery area	
Plastic cutting sticks for papercutter	6
Extra blade for papercutter	1
Assorted plastic bindings, 1/4", 1/2", 1"	100 each
Pint padding cement	1
Padding gauge	1
Extra paper drills, paper drill	2
Wood drilling blocks, paper drill	1 doz.
Rolls wire for stitcher, flat and round	2
Rolls binding tape	2
Darkroom area	
Litho film, 10" x 12"	200 sheets
Litho developer, concentrate	5 galls.
Stop bath, concentrate	1 gall.
Fixer, concentrate	5 galls.
Screens, 65 line, 100 line, 133 line	1 each
Graduates, 32 oz	3
Process thermometer	1
Flashing camp and filter	1
Negative brush, 2"	2
Magnifier	1
Timer	1
Wall mounted squeegee, 18"	1
Hand squeegee, 12"	1
Stripping and Platemaking area	
Masking sheets	200
Rolls litho tape, 1/2"	6
Bottles liquid opaque	2
Opaque brushes	12
Quarts desensitizer	6
Pints lacquer	6
Sponges, photo grade	2
Assorted screen tints	6
T-squares, metal	6
Triangles, metal	6
Miscellaneous	
Kodak graphic arts computer	3
Step gray scales, opaque	3
Rubylith film	

Student Purchased Supplies

Item	Number Required
Proportional scale	1
Red/blue lead pencil	1
Rubber cement	1 bottle
Exacto knife/extra blades	1
Metal rules, 12"	1
Scissors	1
Triangles, 45°, 30°, 60°, 90°	1 each
Illustration board	6
Roll masking tape	1
Acetate for overlays	6
Rub-on registration marks	24
Opaque brush	1

Estimated cost per student $10

FILM LABORATORY

Equipment

Item	Number Required
Super 8 movie camera with 1 to 5 zoom lens	10
Tripods	10
Movie lights, 650 watts	10
Light stands	10
Film editors	6
Universal splicer	6
Wall screen, 50" x 50"	1
Tilting and animation stand with lights, simplified	2
Kodak MFS 8 projector	1
Kodak Instamatic M 100A sound projector	1

Supplies

Item	Number Required
3400° K lamps for titler	8
Lamps, 650 watt for movie lights DVY	20
DKR lamps	2
DNE 150-watt lamps	2
Packages of Super 8 press tapes	32
200' Takeup reels, Super 8	16
4 oz. bottles movie film cleaner	4

Student Purchased Supplies

Item	Number Required
Rolls Tri-X Super 8 film	4
Rolls Kodachrome II Type-A film Super 8	4
Packs of splicing tape	2
Film processing envelopes	4

Estimated cost per student $40

SUMMARY OF COSTS

The preceding lists of laboratory equipment and supplies represent minimum cost estimates and do not include costs of services, utilities, and installation of equipment. In addition to the basic equipment costs, additional sums of $15,000 to $20,000 should be figured for equipment installation, plumbing and electrical services, ventilation, and air conditioning. The initial outlay for supplies, both expendable and nonexpendable, will be high. A continuing budget for supplies, service or service contracts, repair and maintenance, and replacement should be incorporated in budget planning. Careful facility planning and analysis of use make it possible to equip the laboratories at less cost.

LABORATORY FACILITY

	Estimated Costs	
	Supplies	Equipment
Educational Media Techniques	$ 8,000	$ 13,000
Design and Graphics	12,000	13,000
Media Equipment Operation and Maintenance	15,000	18,000
Educational Television Techniques		
Monochrome	12,000	15,000
Color (optional)	100,000	130,000
Photographic Laboratory	10,000	12,000
Reprographics Laboratory	35,000	37,000
Film Laboratory (optional)	3,000	4,000
Total	$ 95,000	$108,000

These estimates are based on 1972-73 prices and do not reflect the costs of capital construction, renovating, or remodeling.

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Appendix A

SOCIETIES AND AGENCIES PERTINENT TO THE EDUCATION OF EDUCATIONAL MEDIA TECHNICIANS

Some of the professional, and technical societies or associations concerned with educational media technology and its applications are useful sources of instructional information and reference data.

The selected list which follows is not a complete listing of all such organizations; inclusion does not imply special approval of an organization, nor does omission imply disapproval. Details regarding local chapters or sections of societies have been omitted.

Teachers and others desiring information from the organizations listed below should address their inquiries to the "Executive Secretary" of the organization. A request for information about the organization and its services or for specific information can usually be answered promptly by them.

Ame ican Association of School Administrators, NEA, 1201 16th Street, N.W., Washington, D.C. 20036.

Association of Chief State School Audio-Visual Officers, Oregon Dept. of Education, Salem, Ore. Organization of officials in state departments of education responsible for audiovisual and new media programs.

American Library Association, 50 E. Huron Street, Chicago, Ill. 60611
Special interest and function of AV Committee: To study and promote the use of all media and materials of an audiovisual nature as they are related to libraries; to cooperate with other agencies having similar functions. Member of EMC.

Association of Technical Artist, P. O. Box 4046, Huntsville, Ala. 35802

Broadcasting Foundation of America, Suite 1810, 52 Vanderbilt Avenue, New York, N.Y 10017.

Association for Educational Communications and Technology, 1201 16th Street, N.W., Washington, D.C. 20036.
Publications: *Audiovisual Instruction, AV Communication Review*
Special Interest: The improvement of education, through effective use of audiovisual materials and methods. Member of EMC.

Gate, Office of Foundation Advancement, 4615 Forbes Avenue, Pittsburgh, Pa. 15213.
Publications: Technical and education materials related to reprographics field.

Industrial Audio-Visual Association, P.O. Box 656, Downtown Station, Chicago, Ill. 60690.
Purpose: To study all means of audio and visual communication, including creation, production, appreciation, use and distribution; to promote better standards and equipment and to establish a high concept of ethics in the relations of members with associated interests.

National Assn. of Educational Broadcasters, 1346 Connecticut Avenue, N.W., Washington, D.C. 20006.
Publications: *Newsletter; Educational Broadcasting Review.*
Purpose: Serves the professional needs of noncommercial radio and television stations, production centers, and closed-circuit educational television installations. Operates radio tape network and television program library service for its members. Member of EMC.

National Association of Industrial Artists, Box 1346, Wheaton, Md., 20902.

National Audio-Visual Association, 3150 Springs Street, Fairfax, Va., 22030.
Publications: *National Audio-Vusual Assn. Membership Directory, Audio-Visual Equipment Directory, NAVA News.*
Purpose: Organization devoted to the advancement of audio-visual communications.

National Instructional Television Center, Box A, Bloomington, Ind., 47401.

Society of Engineering Illustrators, Rackhan Memorial Building, 100 Farnsworth, Detroit, Mich., 48202.

Society of Motion Picture and Television Engineers, 9 E. 41st Street, New York, N.Y. 10017.
Purpose: To advance engineering technology, disseminate scientific information, and sponsor lectures, exhibitions, and conferences to advance the theory and practice of engineering. Presents seven annual awards for outstanding contributions to motion pictures and television. Member of EMC.

Technical Illustrators Management Association, 9363 Wilshire Blvd., Beverly Hills, Calif., 90210.

Television Information Office (of the NAB), 745 Fifth Avenue, New York, N.Y. 10022.

Council on Library Technology, 8722 Calumet Avenue, Chicago, Ill., 60619. An association for the development of library technical assistants and related training programs. Emphasis on promoting concept of LTAs., setting standards for training and certification.

Appendix B

PERIODICALS

Both the students and faculty can readily keep abreast of the new developments in the field by reading current literature and trade journals related to the field. The breadth of the field of educational media, encompassing five or six professional media fields makes for an extensive list of periodicals which contain pertinent information. The following list, by no means inclusive, contains selections related to each of the primary media areas as well as the overall field.

Ad Art Techniques: Ada Publishing Co., (Monthly)

American Cinematographer: (Monthly) A.S.C. Holding Corporation, 1782 N. Orange Drive, Hollywood, Calif.

Audio: (Monthly) North American Publishing Co., 134 N. 13th Street, Philadelphia, Pa. 19107.

Audio Visual Communications: (Monthly) United Business Publications, 200 Madison Avenue, New York, N.Y.

Audio Visual Instruction: (Monthly) Association for Educational Communications, 1201 — 16th Street, Washington, D.C. 20036.

A. V. Communications Review: (Quarterly) National Education Association, 1201 16th Street, Washington, D.C. 20036.

Audio-Visual Equipment Directory: (Annual) National Audiovisual Association, Inc., 3150 Spring Street, Fairfax, Va. 22030.

Audio Visual Marketplace: (Annual) R. R. Bowker Co., New York, N.Y.

Audio Visual Trade Directory: (Annual) National Audio-Visual Association, Inc., 3150 Spring Street, Fairfax, Va. 22030.

AV Materials Handbook: (Annual) Indiana University Film Series, Bloomington, Indiana; Indiana University Audio Visual Center

Back Stage TV/Industrial Film and Tape Directory: (Annual) Back-Stage Publications, Inc., 155 W. 46th Street, New York, N.Y. 10036.

Broadcasting-The Business Weekly of Television and Radio: (Weekly) 1735 DeSales Street, N.W., Washington, D.C. 20036.

Business Graphics: (Monthly) Graphic Arts Publishing Co., 7373 N. Lincoln Ave., Chicago, Ill. 60646.

Communication Arts: (Bi-monthly) Coyne and Blanchard, Inc.

Design Quarterly: (Quarterly) Walker Art Center, 1710 Lyndale Ave., South, Minneapolis, Minn.

Education Age: Educational Services, Visual Products Department, 3M Company, 2501 Hudson Road, St. Paul, Minn. 55119.

Educational Screen & Audiovisual Guide: (Monthly) Educational Screen, Inc., 434 S. Wabash Avenue, Chicago, Ill. 60605.

Educational Broadcasting Review (NAEB): (Bi-monthly) National Association of Educational Broadcasting, Ohio State University, 2470 N. Star Rd., Columbus, O. 43210.

Educational/Instructional Broadcasting Journal: (Monthly) Acolyte Publications, Inc., 647 N. Sepulveda Blvd., Los Angeles, Calif. 90049.

Educational Technology: (Monthly) Educational News Service, Box 508, Saddle Brook, N.J. 07663.

Educational Television: (Monthly) C. S. Tepfer Publishing Co., Inc. 140 Main Street, Ridgefield, Conn. 06877.

Educational Television International: (Monthly)

ETV Newsletter: (Bi-weekly) C. S. Tepfer Publishing Co., Inc., 140 Main Street, Ridgefield, Conn. 06877.

Film News: (Bi-monthly) Film News Co., 250 W. 57th Street, New York, N.Y. 10019.

Graphic Arts Monthly: Graphic Arts Publishing Co., 7373 N. Lincoln Ave., Chicago, Ill. 60646.

Graphic Communications Weekly: (Weekly) Technical Information, Inc.

High Fidelity: (Monthly) Billboard Publications, 165 W. 46th Street, New York, N.Y. 10036.

Index to Kodak Technical Information: (Annual) Kodak Pamphlet No. L-5, Eastman Kodak Company, Rochester, New York, 14650.

Industrial Art Methods: (Monthly) Syndicated Magazines, Inc., 25 W. 45th Street, New York, N.Y. 10036.

Industrial Arts and Vocational Education: (Monthly) CCM Professional Magazines, Inc., 22 West Putman Ave., Greenwich, Ct. 06830.

Industrial Photography: (Monthly) United Business Publications, Inc., 200 Madison Avenue, New York, N.Y. 10016.

In-Plant Printer: (Monthly) Communications Research Machines, Inc. United Business Pub., 200 Madison Avenue, New York, N.Y.

Journal of Broadcasting: (Quarterly) Association for Professional Broadcasting, Temple University, Philadelphia, Pa. 19122.

Journal of the Society of Motion Picture and Television Engineers: (Monthly) Society of Motion Picture and Television Engineers, 9 E. 41st Street, New York, N.Y. 10017.

Media and Methods: (Monthly) Media and Methods Institute, 134 N. 13th Street, Philadelphia, Pa. 19007.

Media Manpower: (Quarterly) Communication Service Corporation, 1333 Connecticut Avenue, N.W., Washington, D.C. 20036.

Modern Photography: (Monthly) Billboard Publications, Inc., 165 W. 46th Street, New York, N.Y. 10036.

NAAB Newsletter: (Monthly) 1346 Connecticut Avenue, N.W., Washington, D.C. 20036.

Pacesetter: Association of Electronic Manufacturers, Eastern Div., 261 Broadway, New York, N.Y.

Photo Methods for Industry: (Monthly) Gallert Publishing Corp., 33 W. 60th Street, New York, N.Y. 10023.

Printing Impressions: (Monthly) North American Publishing Co., 134 N. 13tlf Street, Philadelphia, Pa. 19107.

Printing Magazine: (Monthly) Walden-Mott & Sons Corp., 466 Kinderkamack Road, Oradell, N.J. 07649.

Reproduction Methods: (Monthly) Gellert Publishing Corp., 33 W. 60th Street, New York, N.Y. 10023.

Reproduction Review: (Monthly) North American Publishing Co., 134 N. 13th Street, Philadelphia, Pa. 19007.

School Product News: (Monthly) Industrial Publishing Co., 812 Huron Road, Cleveland, O. 44115.

Technical Photography: (Bi-monthly) In-Plant Photography, Inc.

Training in Business and Industry: (Monthly) Gellert Publishing Corp., 33 W. Goth Street, New York, N.Y. 10023.

Visual Communications Journal: (Quarterly) I.G.A.E.A., Inc., 1025 15th Street, N.W., Washington, D.C. 20005.

Appendix C

PRINCIPAL SOURCES OF RELATED MEDIA

An extremely large amount of information, media, and materials has been developed and is available to support instruction in an educational media technology program. The following list indicates only the primary sources of materials.

1. Eastman Kodak Company, 343 State Street, Rochester, N.Y. 14650 Motion Picture and Education Markets Division
   Technical publications and information relating to photography and graphics presentations and training films, slides, filmstrips.

2. Instructional Media Center, University of Texas, University station, Austin, Tex.
   Professional handbooks and booklets related to media production techniques.

3. Great Plains National Instructional Television Library (Videotape), University of Nebraska, Lincoln, Neb. 68508.
   Videotapes related to instruction of television productions.

4. McGraw-Hill Book Co., Inc., Text-Film Division, 330 W. 42nd Street, New York, N.Y. 10036.
   Series of 8 mm. single-concept films related to media production techniques.

5. Chandler Publishing Company, 124 Spear Street, San Francisco, Calif. 94105
   Series of 8 mm. single-concept films related to media production and equipment.

6. Hester and Associates, 11422 Harry Hines Boulevard, Dallas, Tex. 75229
   Bookets and super 8 film loops related to design and production techniques.

7. Bailey Films, 6509 Delongpre Avenue, Hollywood, Calif. 90028.
   16 mm. films, filmstrips related to design, graphics, and equipment.

8. Scope Productions, Educational Divisions, 1461 West Shaw Avenue, Fresno, Calif. 93705.
   Super 8 film loops — Art and Design.

9. Sterling Educational Films, Inc., 241 E. 34th Street, New York, N.Y. 10016.
   Super 8 film loops — drafting, technical illustration.

10. Basic Skill Films, 1355 Inverness Drive, Pasadena, Calif. 91100.
    Filmstrips related to mediated instruction and equipment.

11. Eyegate House, 146-01 Archer Avenue, Jamaica, N.Y. 11400.
    16 mm. films, filmstrips on media.

12. University of Iowa, Audio Visual Center, Iowa City, Iowa.
    Films and filmstrips related to equipment use and application.

13. Graphics Arts Technical Foundation, 4615 Forbes Avenue, Pittsburgh, Pa. 15213.
    Series of basic informational and technical bulletins related to reprographics.

14. A. B. Dick Company, 5700 Touhy Avenue, Chicago, Ill. 60648.
    Series of sound filmstrips and programmed materials related to graphic communications and reprographics.

15. Technifax Education Division, Plastic Coating Corporation, Holyoke, Mass. 01040.
    Series of multimedia programs and workshops for in-service and pre-service programs and technical information on overhead transparency preparation-utilization.

16. International Film Bureau, 57 East Jackson Boulevard, Chicago, Ill.
    Films related to equipment and equipment operation.

17. Indiana University, Audio-Visual Center, Bloomington, Inc.
    Handbooks, booklets, films related to equipment and media preparation.

18. Association for Educational Communications and Technology, 1201 Sixteenth St., N.W., Washington, D.C. 20036.
    Papers, guides, films, books related to media facilities and educational technology.

19. Ohio State University, Photographic Laboratory, Columbus, O.
    Films and filmstrips related to media and methods.

20. Syracuse University, Film Marketing Division, 1455 East Colvin Street, Syracuse, N.Y. 13210.
    Audiovisual resources for teaching instructional technology — annotated listing.

SOURCES OF DIRECTORIES OF MEDIA MATERIALS

NICEM Directories
Index to 16 mm. Educational Films
Index to 35 mm. Educational Filmstrips
Index to Overhead Transparencies
Index to 8 mm. Motion Picture Cartridges

National Information Center for Educational Media, University of Southern California, Los Angeles, Calif. 90014
Los Angeles, Calif. 90014

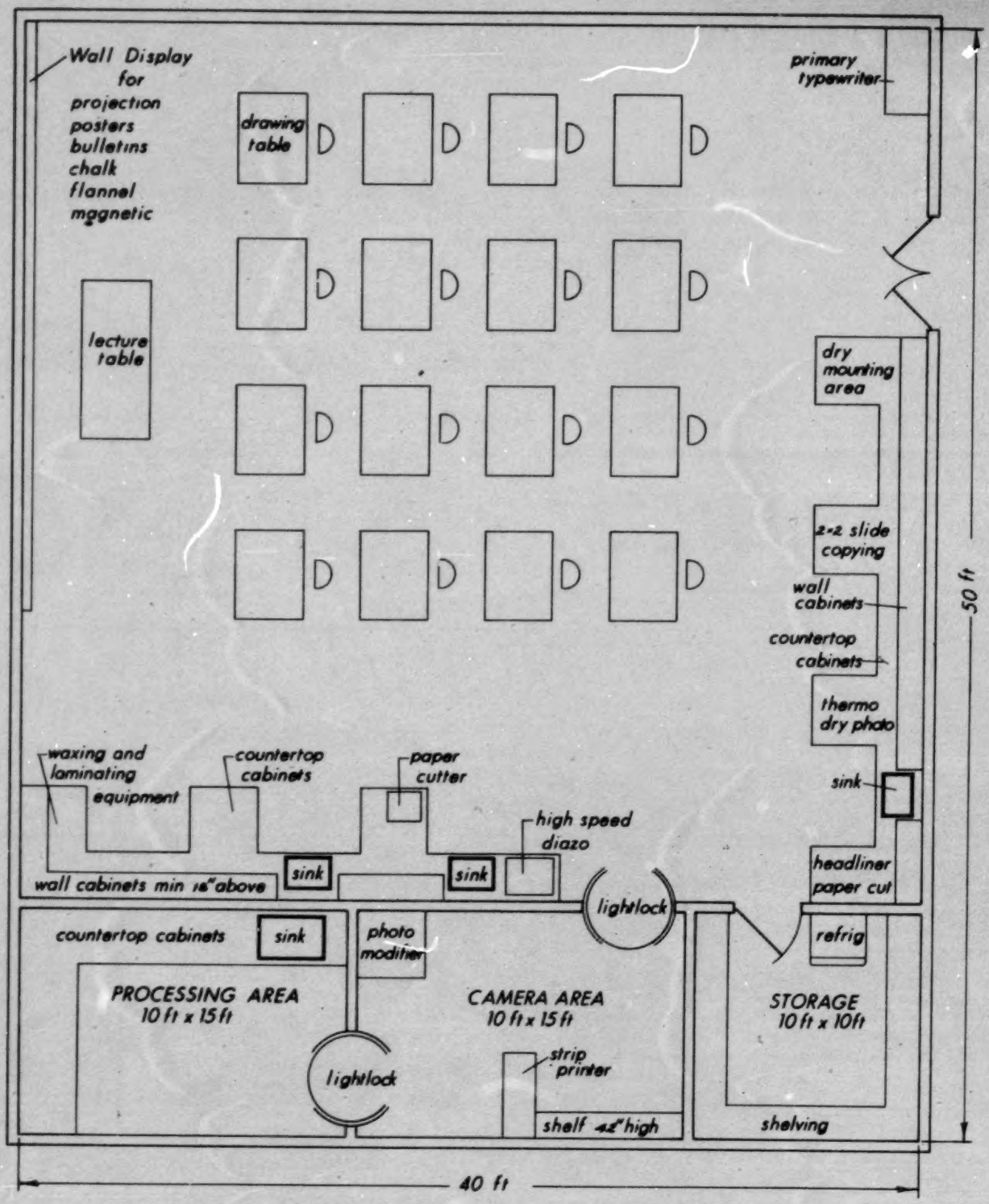
GUIDES TO FREE MATERIALS

Educator's Guide to Free Filmstrips
Educator's Guide to Guidance Materials
Educator's Guide to Social Studies Materials
Educator's Guide to Free Films
Educator's Guide to Free Tapes, Scripts, and Transcripts
Educator's Guide to Free Science Materials
Educator's Guide to Free Health, Physical Education, and Recreation Materials

Published by: Educator's Progress Service, Randolph, Wis. 53956

Educational Media Index, 1970, Published by: McGraw-Hill Book Co., Inc., New York, 10036

Westinghouse Learning Directory, 1970-71, 7 vol., Published by: Westinghouse Learning Corp., New York, 10017



Appendix D

EDUCATIONAL MEDIA TECHNIQUES LABORATORY

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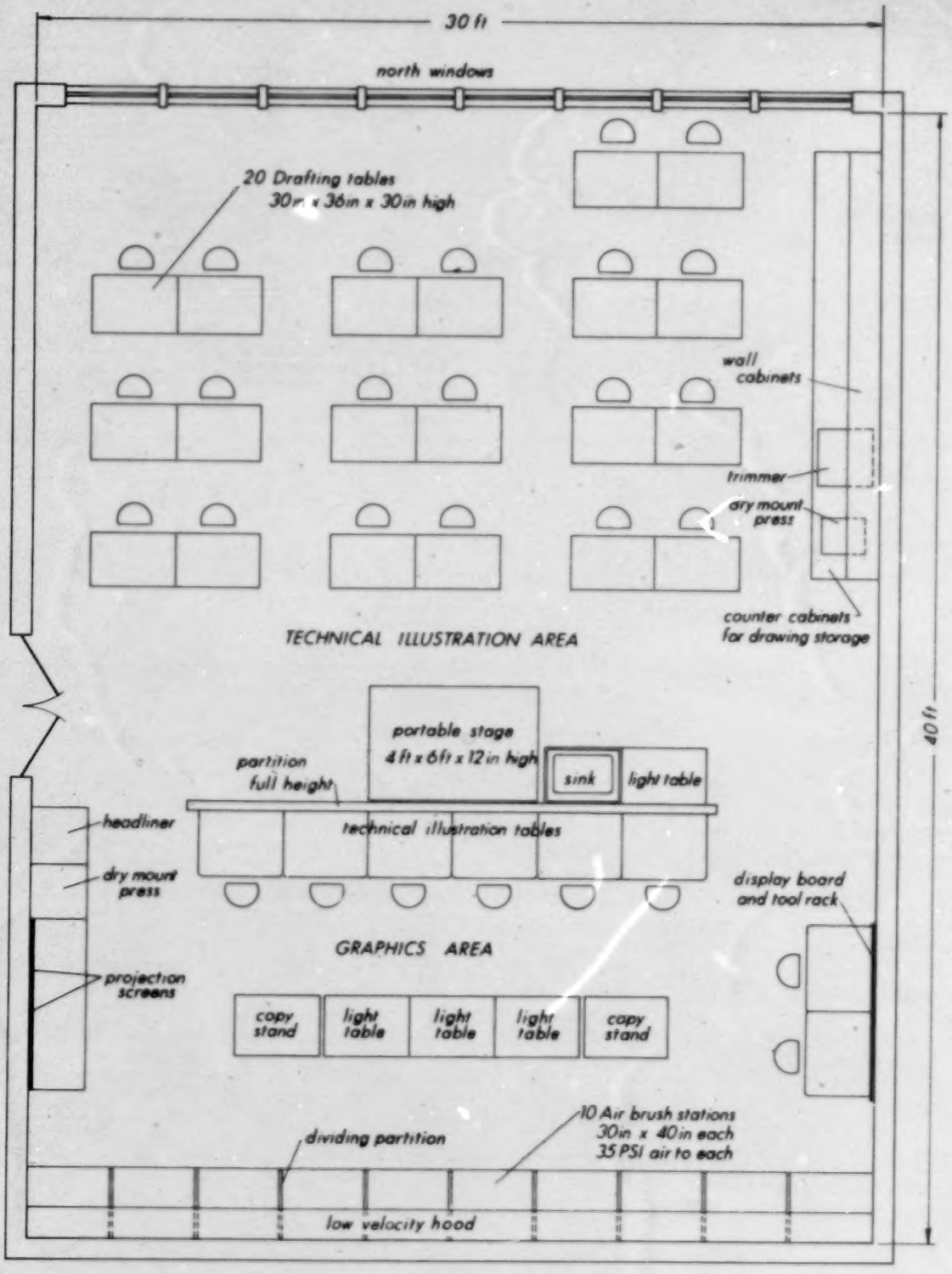
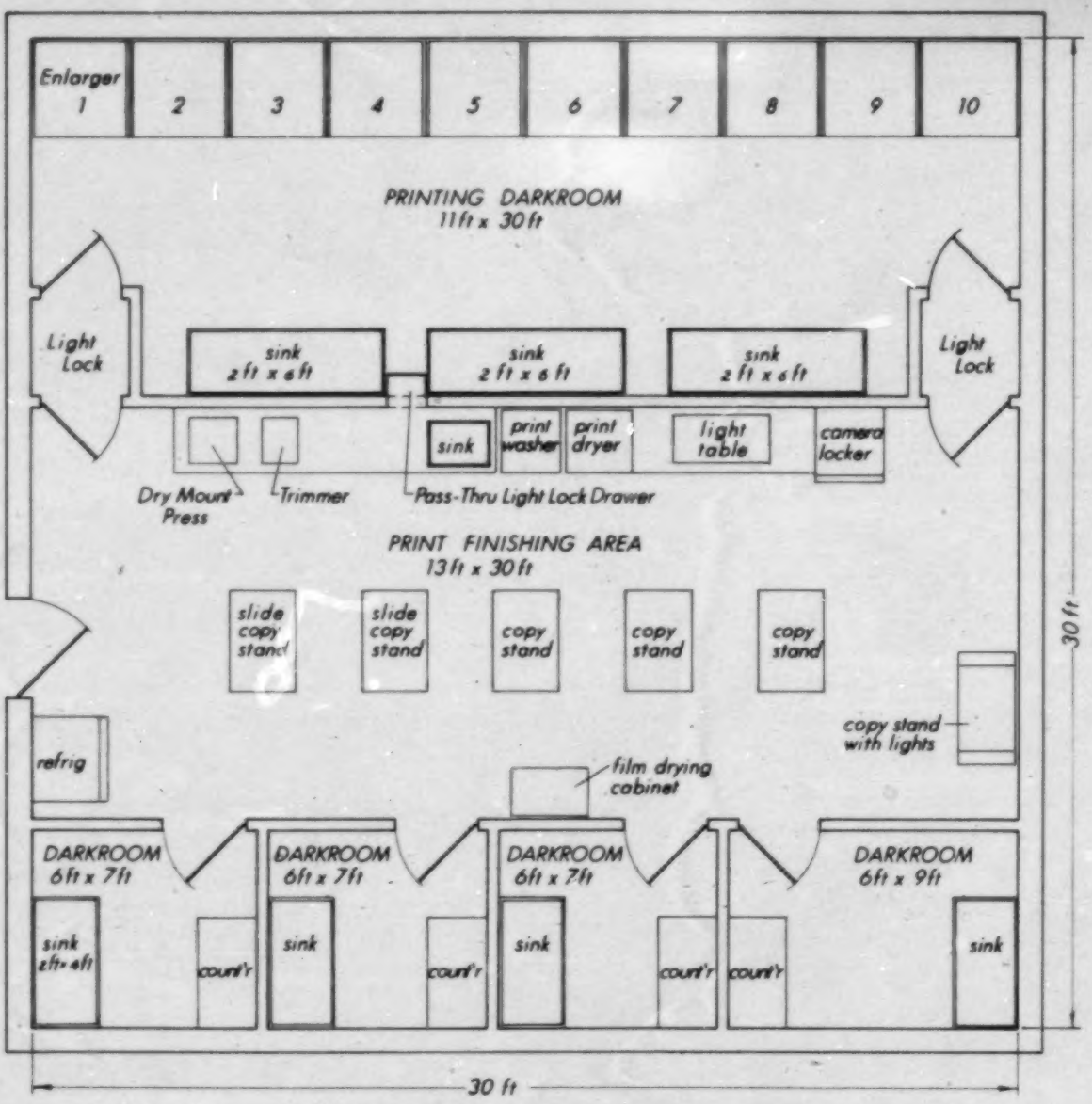


Appendix E

DESIGN & GRAPHICS — TECHNICAL ILLUSTRATION LABORATORY

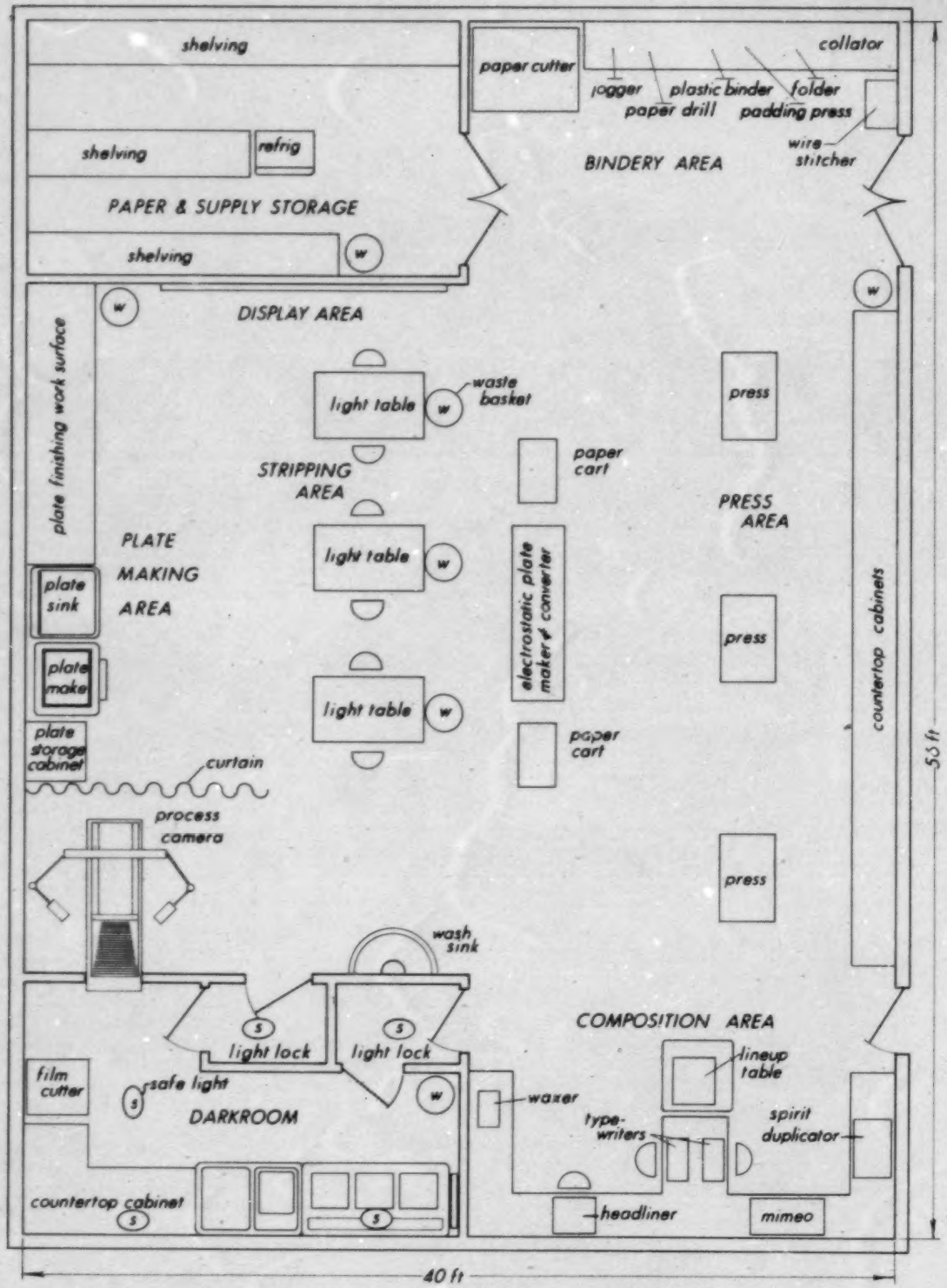


GENERAL REQUIREMENTS

1. *Air conditioning or excellent ventilation with 10 air changes per hour*
2. *All darkrooms air conditioned*
3. *No windows required*
4. *All safe lights on separate circuit*
5. *Hot and cold water to all sinks with temperature and pressure regulation*

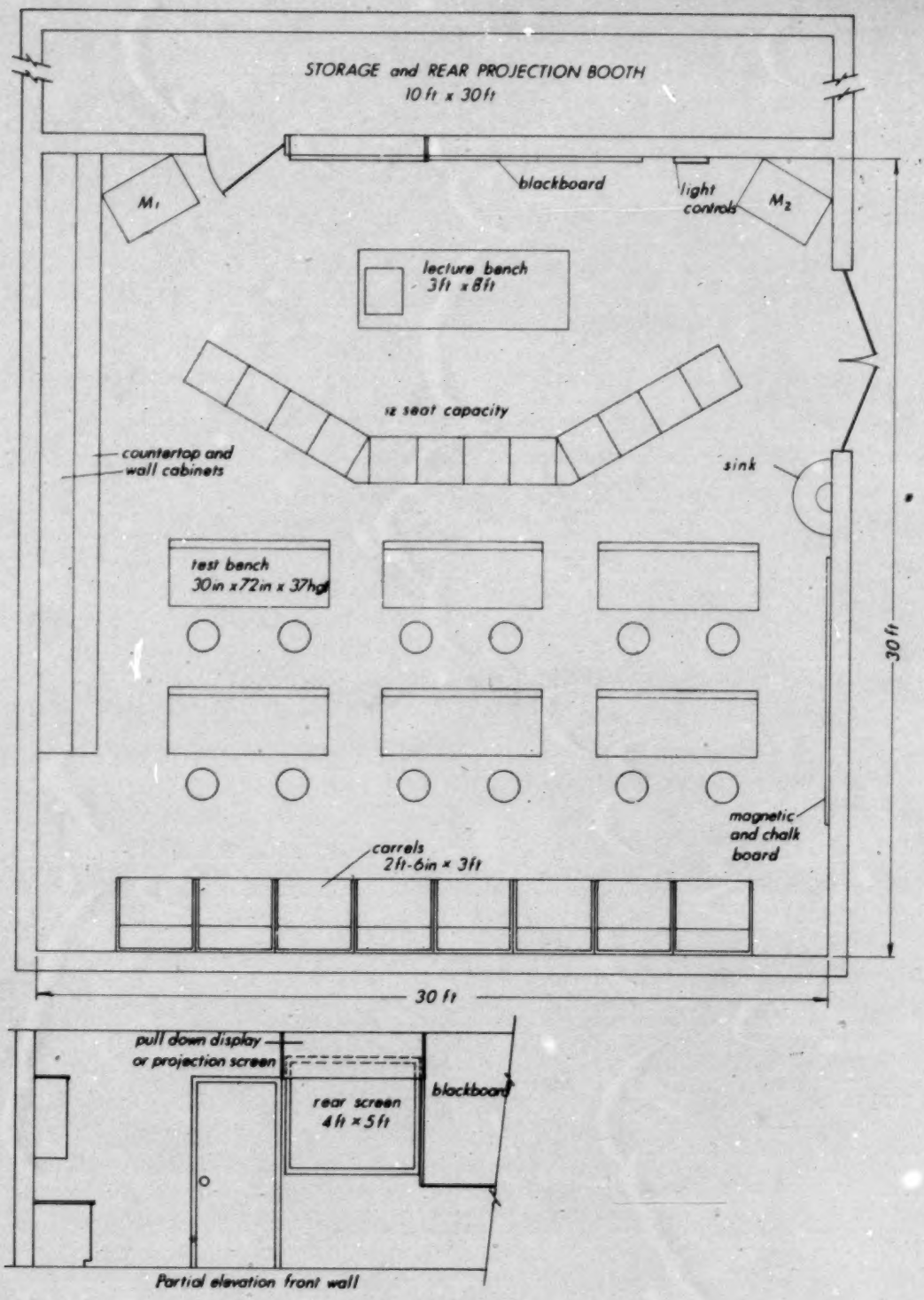
Appendix F

PHOTOGRAPHIC LABORATORY



Appendix G

REPROGRAPHICS LABORATORY



Appendix H

MEDIA EQUIPMENT OPERATION & MAINTENANCE LABORATORY

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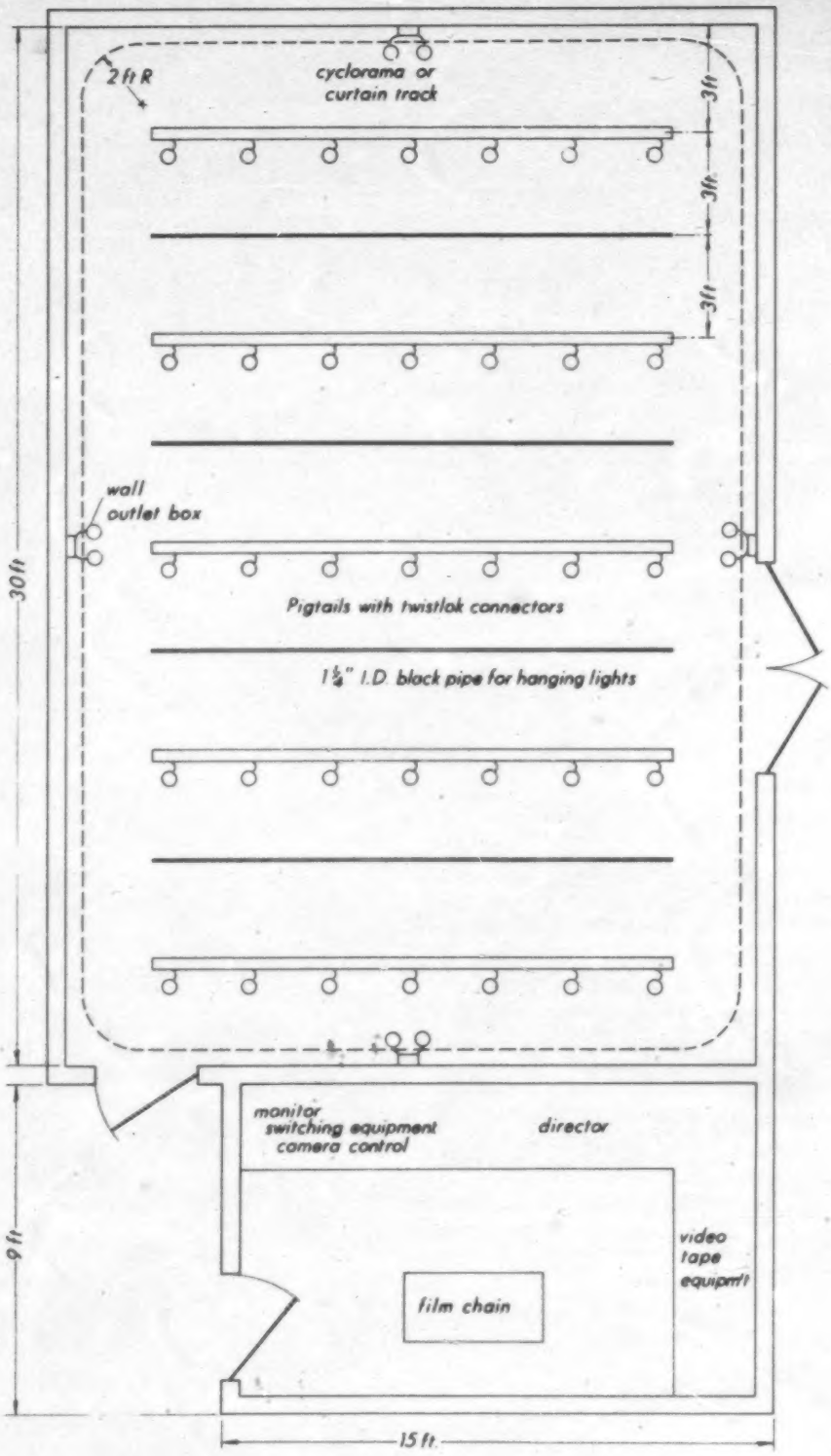

Appendix I

EDUCATIONAL TELEVISION LABORATORY